NATIONAL PETROLEUM NEWS

New Institute Division to Focus Work On Drilling and Production Practice

By Lawrence E. Smith, N. P. N. Staff Writer

COLORADO SPRINGS, June 16

THAT husky youngster, the American Petroleum Institute division of development and production engineering, born last December in Chicago, grew up, put on long trousers and started his life work the past week.

Oil companies displayed their interest in the new division by sending to the Colorado Springs meeting their petroleum engineers to plan for future work of the division and to hear a program of excellent papers on practical operating subjects.

That future work is quite comprehensive and is being shaped with one idea—the more efficient production of oil which means, not alone greater recovery but lowered costs.

John R. Suman, of the Humble Oil & Refining Co., chairman of the general committee of the division, emphasized the highly practical aspects of the work when he announced on the final day the results of the committee's deliberations the previous evening. He said it had been decided to center the work of the division on two committees—that on production technique and that on drilling technique.

There are other committees on rules and methods of procedure; on standardization of development and production records and nomenclature; on development and production research and on metallurgy of oil field equipment. Their work will supplement, aid and to some extent guide the activities of the two committees which will lead.

The division, as constituted, is a system of strong interlocks. At the top is the general committee, with Mr. Suman as chairman; T. E. Swigart, of the Shell Co. of California as vice-chairman and C. A. Young, of the A. P. I. staff as executive secretary. The rest of the general committee consists of the chairmen of the five district organizations, each of which has its own vice-chairman, secretary and committees on the several phases of the subject of development and production engineering. The whole country is covered by these five district organizations and each district will hold meetings from time to time.

Before the committee on drilling technique there is a comprehensive program, Chairman H. H. Anderson, of the Shell Co. of California, announced. The personnel of the committee on this subject, made up of a man from each district, is, in addition to Mr. Anderson: California, Wendell M. Jones, The Texas Co.; Eastern, J. French Robinson, Peoples Natural Gas Co.; Mid-Continent, E. J. McKee, Phillips Petroleum Co.; Rocky Mountain, R. O. Armstrong, U. S. Geological Survey; Tex.-La.-Ark., Melbert Schwartz, Rio Bravo Oil Co. Each of these will act as chairman of his district committee on drilling technique.

The tentative outline of the work for the committee on drilling technique is as follows:

A—Popularization of A. P. I. standard equipment and codes of recommended field practice.

B—Development of special codes, such as one on recommended field practice in the use of Portland cement for rig, derrick and equipment foundations and for use in oil wells. (At the conclusion of Mr. Anderson's report, John F. Hough, of the structural and technical bureau Portland Cement Association, read a paper on the use of cement in oil field work and announced that the association plans to hold schools in the various oil fields where there is assured an attendance of 30 or more. This is to give field men the benefits of the research work the cement association has done and to test and determine the value of sand and gravel that may be found in the field for use as concrete aggregate. Such schools recently were held in the Burbank field of Oklahoma and the Panhandle field of Texas. It is planned also to hold one in Tulsa during the International Petroleum Exposition in October.)

C—Study of power correlations in drilling. "Some operators," said the report, "have suggested that there may be a touch of hysteria in the present movement for increased size, weight and power," of boilers, engines, pumps, etc. It is suggested that a sub-committee carry on a study of power demand, supply and transmission machinery in order that a code may be evolved for the information of operators who are "anxious to conduct their drilling operations on a basis of efficiency and sound practice."

D—Study of new developments in drilling equipment. It is suggested that facts brought out in discussions in the district meetings be coordinated into written reports, probably not mentioning the name of the manufacturer or the trade name of the product, and such reports be published. The attempt would be made to get concrete evidence on the performance of new equipment.

E—Preparations of digests on new drilling methods, similar to those on new equipment.

F—Establishments of a technical information service, probably in the form of an open forum in the proposed new publication of the A. P. I.

G—Cooperation with other committees of the division in suggesting problems to them whose solution would aid the drilling committee and in turn giving information on drilling to other committees.

H—Promote closer relations between technical men

and practical field men. No less ambitious is the suggested program of the committee on production technique, or practice. As outlined by C. E. Beecher, Empire Gas & Fuel Co., general chairman of this committee, the work would be divided into thoroughgoing study and collection of information on the following points:

1—Methods of drilling in, setting screened pipe, coring, etc.

2—Methods of flowing wells; through tubing, chasing, use of flow beans, back pressuring, gas oil ratios.

3—Use of gas lift: Types of equipment, whether portable, central or combination gasoline and gas lift plants. Types of flowing, whether straight flow, intermittent or stage lift. Methods of controlling volume and pressure.

4—Pumping wells. Sizes and depths of tubing. Beam pumping and central power pumping. Study of working barrels, balls, seats, cups, etc. Study of gas/oil ratios of pumping wells, back pressuring. Study of counterbalances, rod tubing and casing wear and prevention.

5—Shooting. Value of cores in determining proper place to shoot. Reduction of human life hazard in handling explosives used in oil well shooting.

6—Swabbing its value and best methods of doing it.

7—Emulsions, means of preventing and of treating for recoverable oil.

8—Water problems, location of source of water and repair of wells.

9—Cleaning out. Methods of removing paraffin and mineral deposits.

10—Repressuring. Study of results of repressuring early in the life of the field, and in the depleted stage of the field. Use of air, gas, inert and hot gases for repressuring. Water flooding. Use of depleted oil or gas sands as storage reservoirs for natural gas.

11—Tankage for lease production. Safety features, hook-ups and evaporation losses.

These two committees deal with the practical, more readily observable phases of oil production. Dr. W. P. Haseman, of the Marland Oil Co., chairman of the committee on development and production research outlined the conception of his committee on several problems of economic importance. Dr. Haseman said he was of the opinion that his committee should be given work to do on one or more of the following problems:

1—Spacing of wells and its effect on present and ultimate recovery.

2—Timing and mode of completion of wells and their effect on recovery.

3—Mode of producing wells and its effect on recovery.

4—Utilization of gas produced with oil and its effect on recovery.

5—Shooting of wells and its effect on recovery.

6—Drilling technique and the design of drilling equipment.

Coming Meetings

Ohio Petroleum Marketers Association, Commodore Perry Hotel, Toledo, O., Sept. 5, 6, 7.

National Petroleum Association, Hotel Traymore, Atlantic City, N. J., Sept. 19, 20, 21.

North American Gasoline Tax Conference, Peabody Hotel, Memphis, Tenn., Oct. 1, 2, 3.

National Safety Council, Petroleum Section, Hotel Pennsylvania, New York City, Oct. 1 to 5.

American Oil Men's Association, Hotel Statler, Detroit, Mich., Oct. 9, 10, 11.

International Petroleum Exposition, Tulsa, Oct. 20 to 29.

Petroleum Refiners Division, National Association of Credit Men, Chicago, Nov. 4, 5, 6.

American Petroleum Institute, Stevens Hotel, Chicago, Dec. 4, 5, 6.

Dr. Haseman brought forward pertinent, fundamental questions:

"How much more oil can be recovered from a property with a spacing of seven acres than can be recovered from a property with a spacing of 40 acres to the well?

"What should be the spacing of wells in a given sand with a given timing and mode of operation to yield a maximum profit?

"How much oil will be lost to an offset well in a given sand with a 400-foot spacing by delaying completion 60 days?"

All these and the legion of similar questions, all having an equivalent meaning in dollars, are ascertainable by statistical method of attack, said Dr. Haseman. Definite rules can be laid down by the examination and correct interpretation of pertinent production data, just as an insurance company arrives at general laws on life expectancy through study of thousands of cases. Again, the general laws on oil recovery can be given further refinement by examination of the data pertaining to each well, after the general law is arrived at by studying many wells.

"The industry has one and only one basic problem," said Dr. Haseman, "the recovering of a maximum of raw materials at an assured and reasonable profit. Each division of the industry must study, analyze and progress in the solution of its problems if the industry is to advance. The industry has millions invested; the mere spending of millions more will not alleviate present situations. Price-fixing through emergency measures, such as restriction in drilling and proration of production will not solve the basic problems of the industry.

"The future of the industry must be built upon a scientific basis. It must go forward in the acceptance and application of methods formulated from the experience of business managers, the employment of conservation principles, the formulation and setting up of standards and in the seeking and utilizing of knowledge. All of these will tend toward the elimination of errors instead of the correction of them, and the substitution of calculations for guesses."

Further reports on the production engineering conference of the American Petroleum Institute are published on page 33 and following pages of this issue.

Controlling

PAPERS read at the final business-day session covered a wide range of subjects. One extensive and highly practical paper was that of T. E. Swigart, production engineer for the Shell Co. of California, on "Methods of Effecting Gas Conservation and Increased Recovery Efficiency in the Ventura Field."

This field, said Mr. Swigart, "furnishes some of the most perplexing operating problems that have ever been encountered in producing oil. Here are found some of the deepest producing wells in the world. Drilling, which is difficult at best because of the great depths and comparatively soft formations, is made even more hazardous by the extremely high gas pressures in the producing zone.

"Moreover, the operators' worries do not end with drilling, and although practically all wells in the field flow naturally at present, the large productions of natural gas, together with limited markets, have resulted in gas wastage and great need for gas control in oil production. New operating methods or policies which would reduce gas production and at the same time insure the greatest oil recovery have been sought by Ventura operators for some two or three years."

Having stated the problem, Mr. Swigart then told of the several experiments at proration of production, chiefly by back-pressuring of wells, and the conservation of gas in the field. He related a number of individual well experiments and gave their widely varying results. His talk was illustrated with production curves and graphs showing gas/oil ratios of wells under different conditions. In conclusion, he said:

"The results of the study . . . have led to the conclusion that, in Ventura field, it is possible to control the gas/oil ratios of flowing wells by regulating the back pressures on the oil sands. In large flowing wells, back-pressures great enough to arrest the oil production decline, or even better, great enough to cause a small increase in oil production for

Concerning the Program of the New A.P.I. Division

LIKE all worthwhile undertakings while they are in the organization stage, the opportunities for service to the oil industry that can be visualized for the new division of development and production engineering of the American Petroleum Institute are manifold.

Those individuals who have in charge the outlining of the program of activity for the division to follow may well be perplexed at the task before them of directing its effort along the best line during the next few years.

It seems to this publication that the oil company engineers who have had entrusted to them this task of defining the working program of their division of the institute could well keep in mind, as necessary to the success of the division, that they must have the support of the oil company executives on the one hand, and the practical oil field man on the other.

If this thought is accepted as fundamental, the outlining of a program of activity will be simplified to the extent that projects will not be considered which, while they might be of tremendous interest and importance from an abstract engineering viewpoint, do not hold the possibility of fruition to the practical benefit of the operating industry within a reasonable time.

The business heads of the oil producing interests gave their promise of support to the new division of development and production engineering through the vote of directors of the institute approving its establishment. They did this knowing that the heads of their own engineering departments must needs devote considerable of their own time to directing and carrying on its activities. At some later time, and rightly, these executives are going to cast up a balance sheet and decide whether the accomplishments of the division of benefit to the industry have been commensurate with the cost of their support of it.

On the other hand, whatever program is undertaken must have the understanding and support of the field man to allow its practical application in producing operations. Consideration of the needs of the man in the field will be the leavening influence that will keep the work of the new division from getting too far into the realm of the abstract. It will also lead to the support of the new division by the practical field man through his taking out memberships which is also necessary to its success.

Consideration of the two factors outlined above need not in any sense be looked upon as limiting the program of this new institute division; but rather insuring its usefulness to the oil industry.—V. B. G.

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a limited period followed by another period of steady production, result in maintaining steady or lowering gas/oil ratios.

"The control of small flowing wells has been more difficult to accomplish, though recent results indicate that they too can be controlled by a careful adjustment of the back-pressures. This conclusion is supported by the history of practically every well for which detailed daily oil and gas production figures are available.

"Application of the back-pressure control method of production can only be successful through cooperative action of all operators in the field. Uniform increases in back-pressure would have to be maintained throughout the field to prevent a few wells from venting gas shut back in others and thereby destroying the beneficial effects of reducing gas/oil ratios.

"Should this operating policy develop successfully, as seems likely, it is probable that, eventually, wells will be beaned from their inception. It now appears that, within the safe limits of pressure, wells should be beaned immediately after they 'clean up' until they can be sustained at a new lower level of production which will insure constant, or at best, slowly increasing gas/oil ratios.

"The effect on future oil production of a policy of back-pressure control, with resultant present decreases in oil production, is of greatest importance and has a number of advantages in a field like Ventura where cooperative action of oil operators is assured. It reduces gas wastage, in times of overproduction of gas. It increases oil recovery efficiency and total ultimate production of oil. Through reduction of gas/oil ratios, it justifies a moderate drilling program which otherwise would result in a lower ultimate oil production due to the action of producing wells in draining gas from undrilled parts of the field.

"A successful control of gas production so that gas surplus does not exceed the market will also increase total revenue by reducing gas wastage to the air and causing a recovery of the total available gas at such rates that all surplus above field needs can be sold.

"These considerations lead to the adoption of the third proration program in Ventura field, and although successful operation of the plan has involved many unforeseen difficulties, they are being met as fast as experimenting will indicate the proper solution. The third proration program eliminated about 40 million cubic feet per day of gas wastage and the results are being improved still further by reducing productions to compensate for the normal decline of the field."

"Notes on Operating Practice in the Rocky Mountain District," a paper by Fred E. Wood, petroleum engineer for the Midwest Refining Co., was read by the author. It will be published in a future issue of NATIONAL PETROLEUM NEWS.

Summary of paper by J. French Robinson, chief geologist Peoples Gas Co., Pittsburgh, and J. G. Montgomery, Jr., United Natural Gas Co. on "Deep Drilling in the Appalachian field by the Cable Tool Methods," read in the absence of the authors.

"The trend of practice at the recent deep test wells in the Appalachian field is to carry the larger holes as deep as possible, to eliminate the handling of long strings of casing, and to more systematically collect drill cuttings and other data concerning subsurface conditions.

"Aside from the expediency in fishing, the larger hole sizes minimize disastrous effects of gas pockets because much more clearance between tools and the wall is available. The larger diameter holes probably account for the facts that the fishing jobs were successful and gas pocket blows were overcome.

"Attempts to eliminate the handling of long strings of casing have resulted in the use of liners and the setting of casing in sections.

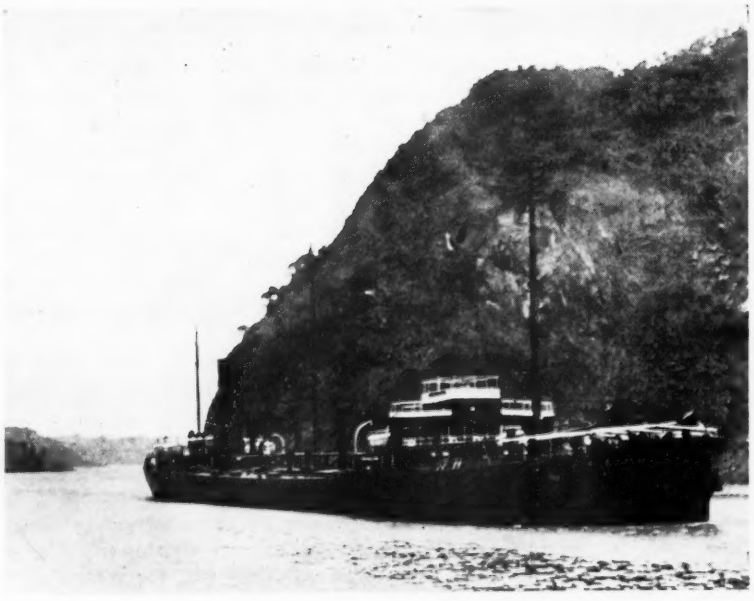
"A point of much importance is the length of time required to reach the objective in deep testing. Drilling on five of the active Appalachian wells has been in progress from 2½ to 6½ years and one company is drilling in its third hole in its attempt to test the White Medina sand."

Corrosion Committee Will Study Pipe Coatings

COLORADO SPRINGS, June 16.—With a majority of the members of the A.P.I. general committee on corrosion present, meetings were held during the week to outline work for the next few months, or to the time of the annual meeting of the A.P.I. in December. Further conferences will be held by a sub-committee later to outline the program for that meeting.

Specifically, the committee will first address itself to the subject of protective coatings for pipe lines.

(Continued on Page 22)



A loaded oil tanker passing through the Culebra cut in the Panama Canal

Photo by N.E.A., Inc.

Major Companies May Prevent Dumping Of California Gasoline in East

By William E. Green, N. P. N. Staff Writer

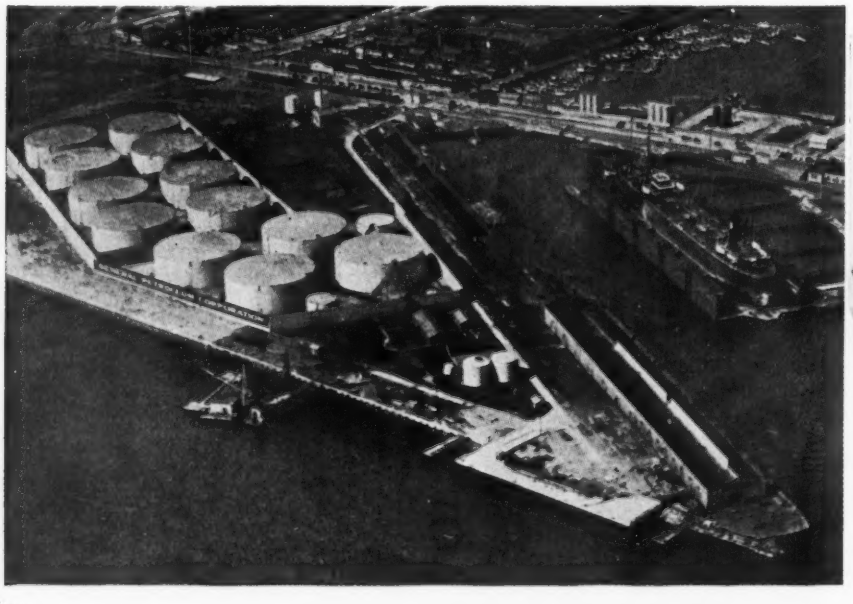
LOS ANGELES, June 16

CALIFORNIA gasoline will be shipped to the East Coast all this year and will be a factor in the general market situation, but there is little chance of the West Coast product having an adverse effect on the price.

Considerable of the California product that will be shipped to the Atlantic coast, will be moved by companies that have California affiliations. These companies naturally will not do anything to force a lower market.

California has better than 13,000,000 barrels of gasoline in storage to be drawn on as needed and when the price is satisfactory. Active refineries are operating at about 70 per cent of their capacity and cracking units are not operated to their full capacity by any means. In fact, several companies are not operating their cracking units, and will not until there is more need than now.

If the price of gasoline advances further, refineries will be operated nearer to capacity and more gasoline will be cracked. But this increased output will not come until California refiners can sell their product at 8 cents or better, net at deep water terminals.



Before 0.25-cent advance in tank car prices at New York last week, no California refiner was willing to sell any large quantity of gasoline to move over the next three or four months at less than 7.75 cents, and

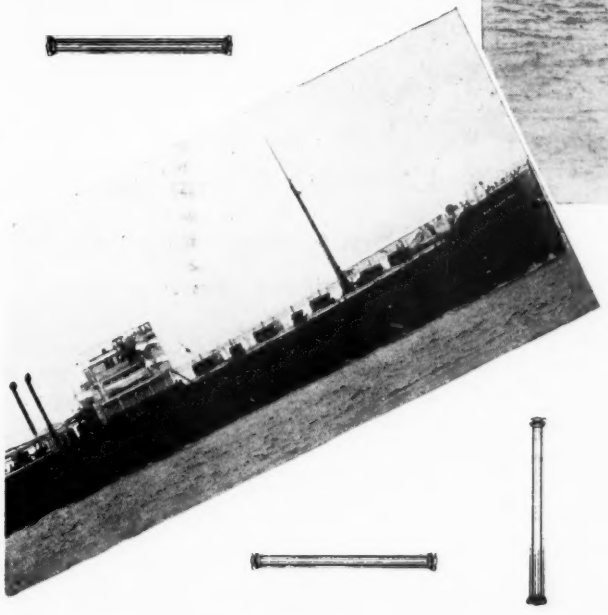
most of the major refiners were refusing to consider less than 8 cents. It is generally understood that considerable gasoline in storage in the state is held for more than 8 cents and will not be for sale for tanker movement until the better price is paid.

The California refiner will welcome a larger outlet for his gasoline. The market on the West Coast, California's natural trade territory, is rather sick these days.

It is true that under present circumstances, much of the motor fuel consumed within the state is netting the major refiners between 9 and 9.50 cents a gallon at the refinery. A portion is netting the companies as high as 11.50 cents, but against this situation, a small portion is netting not more than 8.50 cents.

There is more profit in moving gasoline in tankers at 8.50 cents than selling the same amount in the local market at lower differentials due to expenses of operating bulk stations and tank wagons, overhead, etc.

Photo by N.E.A., Inc.



At the bottom of the opposite page is the main marine terminal of the General Petroleum Corp. at Los Angeles harbor with 1,000,000 barrels storage capacity from which tankers are loaded for domestic and foreign ports. The tanker is the Mary Ellen O'Neil of the California Petroleum S. S. Corp.'s fleet, completed Feb. 25, 1928, with a net tonnage of 7221 and speed of 12 knots. Above is a segment of New York's skyline over the Battery. The tower building in the center is 26 Broadway —Standard Oil Co.

It has been estimated that close to 10,000,000 gallons of gasoline monthly is being marketed in California now at differentials ranging from 5 to 7.50 cents under the service station price, without tax, delivered into resellers' tanks. This situation was brought about by the recent tank wagon price wars, and there is still more danger of the war breaking out again, with a still greater danger of the situation becoming worse than at any time in the history of the oil business in California.

Rumors are current that the present demoralized situation may lead to a drastic cut in service station prices, and if this happens, refiners will net around 6 to 7 cents at the refiners for their product.

It is also understood that a movement is on foot to build a pipe line to the harbor, connecting several small refineries to enable these plants to piece out cargoes. At present, no small refinery or combination of small plants can load a tanker, due to lack of pipe line and terminal facilities. Even if such steps are taken, facilities could not be ready for business this summer.

In April, this year, 43 refineries were operating at about 70 per cent of capacity, rated at 826,200 barrels daily. This compares with 49 plants operating one year ago with 793,800 barrels daily capacity. Last April, 35 small plants with indicated capacity of 56,725 barrels were idle, compared with 31 idle plants with a daily capacity of 61,825 barrels one year ago.

The gasoline manufactured closely equals consumption plus exports. With better prices prevailing, runs could be increased, and probably would if the incentive should be sufficient. But the East Coast has little fear, as California gasoline will not be dumped on that coast at a laid down price under 10.50 cents.

Until the tank car price at New York exceeds 12 cents, there is little chance that larger quantities of California gasoline will be sold into that territory. California refiners have also come to the conclusion that their gasoline should sell at a premium of 0.25 to 0.50 cent in competition with the Mid-Continent product.

Cracked gasoline is not a big factor at this time in California, but can become most important when conditions justify. Cracked gasoline output was 3442 barrels daily in 1926 and 10,374 barrels daily in 1927. In the first four months of 1928, cracked gasoline was produced at the daily rate of 19,244 barrels.

Shell Co. is operating a cracking plant at Dominguez with a daily capacity of around 16,000 barrels of fuel oil. Standard Oil Co. of California is installing cracking units at El Segundo. The Texas Co. has two Holmes-Manley units at Los Angeles ready to run when the gasoline is needed. Other refineries can also start up their units full tilt, if they wish to increase their output.

California stocks of refinable crude are being drawn upon almost every month, but sufficient stocks are on hand to take care of any reasonable increase in refinery runs.

Production of natural gasoline is slightly above ordinary demands at this time, with indications that this large production will continue at least three or four months.

California also has considerable crude production shut in, to conserve the supply for a time when needed

worse than at present.

Shipments of gasoline from California to points outside the state's natural trade territory, which includes offshore movement, except along the Pacific domestic coast, is expected to hold up to last year's figures and probably show an increase. The movement in this trade averaged 50,352 barrels daily in 1926 and 64,481 barrels daily in 1927. The movement averaged 69,096 barrels daily the first four months this year, against 56,280 barrels daily in the same period in 1927 and 46,232 barrels daily in the first four months in 1926.

West Coast's daily average indicated consumption in 1926 was 78,700 barrels against 96,504 barrels in 1927. Daily indicated consumption the first four months of 1928 was 89,269 barrels gainst 80,793 barrels in the same period in 1927 and 69,152 barrels in 1926. These consumption figures are arrived at by taking total production of gasoline monthly, deducting shipments to points outside of trade territory and taking into consideration withdrawal from or addition to stocks.

East Coast draws a large portion of the offshore shipments. For instance, against a total daily average movement of 50,352 barrels to all points in 1926, 22,254 barrels went to East Coast. In 1927, movement to East Coast was 31,150 barrels daily of a grand total offshore movement of 64,481 barrels. In the first four months this year movement to East Coast was 33,699 barrels daily against total movement of 69,096 barrels daily, to all points, same period.

Gasoline stocks have shown net increases each year for the last several years. During 1926, the net increase was 1,636,310 barrels and in 1927 924,891 barrels. In the first four months of this year, the net increase was 1,021,467 barrels to a grand total of 13,755,230 barrels, but withdrawals are expected to be made the next four months.

Shipments of crude oil from California so far this year have not equaled the daily average movement of the previous two years. In 1926 daily average export was 46,340 barrels against 41,481 barrels in 1927, while movement first four months of 1928 averaged only 27,052 barrels daily.

Tanker rates also have a direct bearing on the movement of gasoline from California. Rates were as low as 50 to 55 cents a barrel to East Coast but in the last several weeks, practically every new charter was at an advance, until latest asking prices are 85 to 88 cents a barrel, slightly better than 2 cents a gallon. These rates include canal tolls.

There is an impression that tanker rates will show further increases during the summer as clean boats seem to be scarce. Boats to handle fuel oil and crude can be chartered at around 55 cents a barrel.

Boyd Says Co-operation Is Best Saving Aid

FORT WORTH, June 19.—The cause of conservation of American reserves of crude oil is best served by the intelligent, broad minded co-operation of governmental authorities with the oil industry, William R. Boyd, Jr., assistant general secretary and counsel of the American Petroleum Institute, said in his address before the general session of the West Texas Chamber of Commerce at Ft. Worth June 19.

Mr. Boyd told the Texans that through the cooperation of the Texas Railroad Commission, under which the oil industry operates in that state, nearly 1,000,000 barrels a day of oil was being left in its natural storage for future use. This, said Mr. Boyd, is true conservation.

Restrictions on production promulgated by the oil industry were not imposed with any idea on its part of obtaining an unfair price for its product from the consuming public. Rather, said Mr. Boyd, these restrictions were imposed with the idea of leaving oil in excess of that needed for daily consumption in the storage provided for it by nature, where it is best cared for, not being subject to fire hazards, evaporation and the other losses occasioned by the imperfections of artificial storage.

Figures compiled by the American Petroleum Institute showed that had it not been for improvements in the methods of extracting gasoline from the crude oil which have been developed by the refining branch of the industry in the last few years about 575,000,000 barrels more oil would have been required to meet the demand during 1927 than was actually used. This volume of oil was conserved, said Mr. Boyd, for future use.

Shipping Board Pays N. Y. Fuel Price

WASHINGTON, June 18.—According to purchasing officers of the United States Shipping Board, which buys fuel oil for the government's ships through the agency of the Merchant Fleet Corp., there is not a word of truth in the reports sent out from Washington recently to the effect that the board was buying fuel oil under a modified contract naming something less than $1.40 a barrel. The contract has not been revised. It runs to the end of 1928. Before it runs out bids for a new contract, for one year, will be invited.

The government is not paying $1.40 a barrel. It is paying the market price, the foundation for which is the price paid for such fuel oil in New York harbor. The government's contract calls for the market price not exceeding $1.40. Revising the top price figure now would not mean anything unless a wholly unexpected upward bulge in fuel oil prices occurred.

Bids for supplying bunker fuel oil to government merchant ships will be opened in Washington at 2 p.m. June 27. The contract for supplying about 1,000,000 barrels will be for one year from Jan. 1, 1929 with a provision that if the government elects it may renew the contract for two additional periods of one year each at the prices and conditions named in the contract. That option, however, is to be without obligation on the part of the corporation to pay out money in excess of the appropriations Congress may make for such purpose.

The provision for renewal is a gesture toward compliance with the desire of oil companies to make long term contracts. Representatives of oil companies have talked with the purchasing agents of the Shipping Board. The latter get the idea that the willingness of the oil companies to make three-year contracts to the conviction that the supply in sight in the United States and the prospect of big production from South America make such contracts of no risk whatever.

Corrosion Committee Will Study Pipe Coatings

(*Continued from Page* 19)

In so doing it will not attempt to pass upon the merits of the various commercial coatings now on the market, but will attempt to establish a code on the best manner of applying them.

A sub-committee headed by Dr. W. P. Haseman, of the Marland Oil Co., is now collecting data by the questionnaire method and Dr. Gordon N. Scott, formerly of the Mid-Continent Petroleum Corp., now retained by the A.P.I., will travel extensively during the next few months, gaining information on the coating and pipe wrapping methods now employed. He will soon open offices in Dallas and from there will go to most of the oil fields.

D. V. Stroop, secretary of the A.P.I. committee on corrosion, reported that a considerable number of replies have been received on the questionnaire blanks recently sent to oil companies by the committee. The data is highly interesting, but a vast amount of study will be required to classify it properly and draw from it conclusions.

LOS ANGELES, June 14.—J. C. Ballagh, of Patterson-Ballagh Corp., Los Angeles, was in Colorado Springs attending sessions of the A. P. I. Committees. Before returning to Los Angeles, Mr. Ballagh will tour several Mid-Continent oil fields.

New Refinery Adapted to Small Field And Needs of Local Market

By Paul Truesdell
N. P. N. STAFF WRITER

CLEVELAND, June 18

WHEN the roll of oil refining states was called, up to the end of last year, there was a gap between Massachusetts and Missouri. If it were called now, Michigan would answer up "present" right after Massachusetts.

The Standard Oil Co. of Indiana put Michigan in the column of refining states when it built a refinery at Zilwaukee, a few miles out of Saginaw. This plant began operation Dec. 7, 1927. It was designed to handle the crude oil produced in the field around Saginaw—a few hundred barrels a day—but since it was built more production has been developed at Muskegon, across the state some 140 miles away, and the new refinery is also running the crude from the Muskegon field.

The fact that the Standard built the refinery at Saginaw when the actual oil production was small and the field is only a little more than 200 miles from the big refinery at Whiting shows the trend toward building small refineries when possible where the raw material is close by and where the finished products can be distributed within a short radius.

All the products of this newest of the Standard refineries are marketed within a very narrow territory around the plant, so narrow in fact, that they move in tank cars on practically a switching charge. Very little moves even as far as Flint, some 40 miles away.

The plant is elastic. It could be indefinitely increased in capacity by the addition of units of the same type as already installed, in case large enough production should be developed in the state. On the other hand, although it is in no sense what would be called a portable plant, it could be dismantled and moved away with a high percentage of salvage.

It is not so located that it could be supplied with Mid-Continent crude direct from the transcontinental pipe line, Whiting being the nearest point of approach of the main trunk line. It is conceivable that crude delivered by pipe line to Whiting could be barged or tankered across Lake Michigan to Muskegon and then shipped in tank cars to Milwaukee. The refinery is located on the Saginaw river about 20 miles west from Saginaw Bay, an arm of Lake Huron.

It seems evident, however, that the Standard of Indiana believed when the plant was projected, that the crude supply of the state would be sufficient to supply it until it had at least paid for itself.

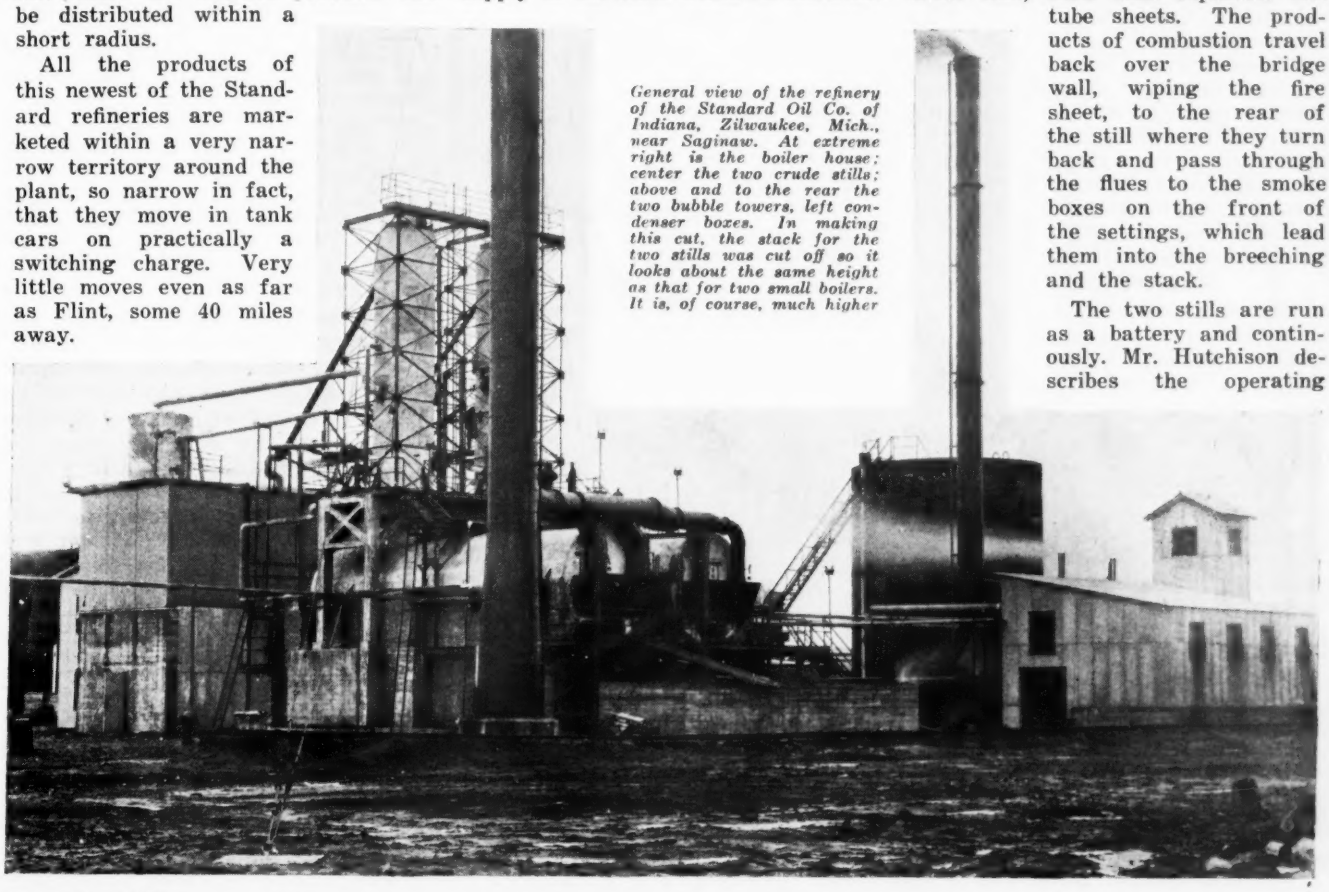
The refinery probably represents an investment of close to $300,000. It consists primarily of: two 11 by 40-foot shell stills with internal flues; two 13-plate bubble towers; two 250-horsepower boilers; continuous sweetening plant; water pump station; ethyl gasoline mixing plant; absorption plant.

The refinery was designed by the Standard of Indiana engineering department.

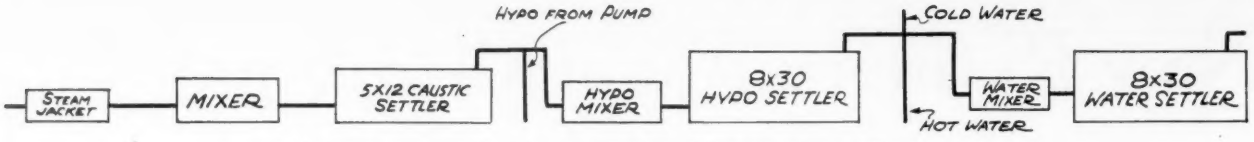
W. A. HUTCHISON is superintendent. He was assigned there from the company's tank farm at Bay City, of which he was in charge. Before he went to Bay City he was doing work for the Standard of Indiana at Baton Rouge and before that at the Whiting refinery.

The crude stills are mounted in high settings, the bottom sheets being about five feet above the grates which are designed for coal burning. The furnaces are fired by hand. Each still has 46 four-inch tubes in the lower half, their ends expanded into tube sheets. The products of combustion travel back over the bridge wall, wiping the fire sheet, to the rear of the still where they turn back and pass through the flues to the smoke boxes on the front of the settings, which lead them into the breeching and the stack.

The two stills are run as a battery and continously. Mr. Hutchison describes the operating



General view of the refinery of the Standard Oil Co. of Indiana, Zilwaukee, Mich., near Saginaw. At extreme right is the boiler house; center the two crude stills; above and to the rear the two bubble towers, left condenser boxes. In making this cut, the stack for the two stills was cut off so it looks about the same height as that for two small boilers. It is, of course, much higher



Flow sheet of continuous treating plant at Standard of Indiana refinery, Zilwaukee, Mich.

Muskegon Crude

Gravity	38-39 A.P.I.
Gasoline	32½ per cent
Furnace oil	21 per cent
Fuel oil	46 per cent

Saginaw Crude

Gravity	44-45 A.P.I.
Gasoline	50 per cent
Furnace oil	18 per cent
Fuel oil	32 per cent
Hydrogen sulfide	0.2 per cent

system of the plant as follows:

Cold crude is pumped continuously through a pancake coil heat exchanger in the top of No. 1 bubble tower. This constant flow of cold crude, of course, regulates the temperature in the top of the tower according as the flow is increased or reduced.

From this coil the crude passes into a like coil in the top of No. 2 tower, thence through a tar heat exchanger, where it passes countercurrent to the stream of residuum being pumped from the bottom of No. 2 still and thence is discharged upon the fourth bubble tray from the bottom of No. 1 tower. From there it continuously overflows, passing through trays 3, 2 and 1 into No. 1 still. The crude reaches the fourth bubble tray at about 300 to 350 degrees F. Considerable distillation has already been accomplished and more occurs as the oil passes through the lower trays of liquid on its way downward into the still.

OFF THE top of No. 1 tower is taken a stream of light naphtha and a heavy naphtha stream is taken continuously from the top tray in the tower. These two streams are condensed and flow together into the tail house. Samples of the stream are taken at intervals in the tail house and tested for gravity. The gravity of the stream is regulated by regulating the volume of heavy naphtha taken into the stream from the top tray of the tower.

The oil from No. 1 still is steam lifted as it reaches a certain level and jetted into No. 2 tower, entering above the fourth bubble plate from the bottom. A gravity flow line is installed from still to still, however, to prevent oil backing up in No. 1 still in case the steam lift failed to work.

Off the top of No. 2 tower is taken a heavy naphtha stream. This goes from the lookbox to a drum beneath the condensers. The level is kept constant in this drum by means of a float and the overflow goes to storage. This naphtha furnishes the pumpback to trim No. 2 tower. The cold naphtha is pumped in an open stream into No. 2 tower above the top tray and knocks out the heavy ends of the vapors. The gravity and distillation range of the stream from the tower is governed by the amount of pumpback.

When the battery is starting up, all the heavy naphtha is pumped back over the top of the tower until the stream coming over in the house has the desired gravity. There is a meter in the line to indicate the amount of naphtha going through. When the gravity of the stream is right the volume going through the meter is reduced, the excess naphtha bypassing the meter and going into the drum and thence to the receiving tank. This naphtha is blended off with the other stream to make motor gasoline.

Map showing relative position of Zilwaukee, Saginaw, Muskegon and Whiting

THE gasoline made at this refinery, according to Superintendent Hutchison, is high in anti-knock value, comparatively, it being necessary to add a little less than two cubic centimeters of Ethyl fluid to the gallon to bring it up to the prescribed anti-knock standard of the Ethyl Gasoline Corp. Three cubic centimeters to the gallon is the amount required with the average gasoline.

The characteristics of Saginaw and Muskegon crudes, as given by Mr. Hutchison will be found accompanying this article.

A stream of about 42-43 gravity is taken off the fifth tray from the top of No. 2 tower and this is sold as furnace oil or stove distillate. It is planned shortly, however, to finish this product by acid treatment and make kerosene. It will be remembered that the heavy ends, steamjetted into the tower from No. 1 still, continuously make their way through the trays down into No. 2 still.

The residue which is continually drawn off from No. 2 still is an industrial fuel oil of 26 gravity which is sold to nearby factories.

The gasoline is sweetened with caustic soda and sodium hypochlorite and washed with water.

The plant for sweetening the gaso-

Showing how nested pipe mixer used at plant of Standard Oil Co. of Indiana at Zilwaukee, Mich., is made

line continuously is interesting for the small amount of equipment involved. It consists of three horizontal tanks and three mixers with the necessary piping and pumps. A flow sheet of the system is shown in an accompanying drawing.

The mixer used to secure intimate contact between the gasoline and the chemicals is the design of the Standard of Indiana engineering department. It is only about two and a half feet long and yet it is very efficient. An accompanying sketch also shows the design of this mixer.

The mixer is composed of three nipples of 4-inch, 6-inch and 8-inch pipe respectively, nested and flanged together and welded closed at one end. The two inside nipples are perforated with small holes. Gasoline and caustic soda solution of 15 A.P.I. gravity in a predetermined ratio are pumped into a 3-inch line that carries them into the mixer which is simply flanged into the line.

The line discharges the soda-gasoline mixture into the open end of the 4-inch nipple from which it is forced through the small perforations into the 6-inch nipple; then through the perforations in the 6-inch nipple into the 8-inch, from which it escapes through the outgoing 3-inch line into the caustic settler, which is a 5 by 12-foot tank set on a slight slant. The caustic continuously settles out of the liquid and collects at the lower end of the tank from which it is pumped off. An accompanying sketch shows construction of the mixer.

When the tank fills, the caustic-free gasoline overflows through a line in the top of the caustic settler, meets a stream of hypochlorite solution, passes through another mixer, through another settling tank in which the hypochlorite settles out, thence out at the top into another line to meet a stream of hot or cold water, passes through another mixer, through a third settler and out to the receiving tank as finished gasoline.

THE furnace oil is given the same treatment, mainly to deodorize it, except that it is handled by batch. Sometimes it is difficult to settle the water out of the furnace oil.

When this difficulty is met, the oil is blown with air through a spider in the bottom of the horizontal tank like the steam spider in a still.

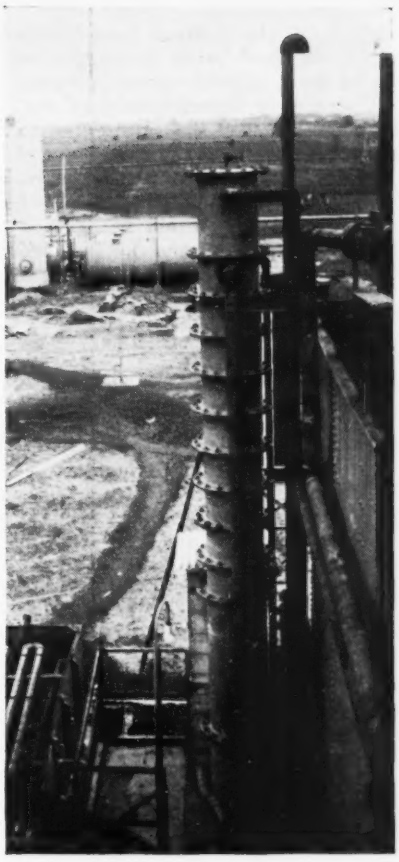
The purpose of washing the gasoline with caustic soda is to remove the hydrogen sulfide. It is very important to get all this out, Mr. Hutchison says, before the hypochlorite wash is given, because any hydrogen sulfide will break down the hypochlorite solution and destroy its efficiency.

Frequent tests of the stream coming out of the caustic settler are made to determine whether hydrogen sulfide is present, the lead acetate test being used. In this test the sample is shaken up in a bottle with lead acetate in much the same way that a sample is shaken with doctor solution in making the doctor test.

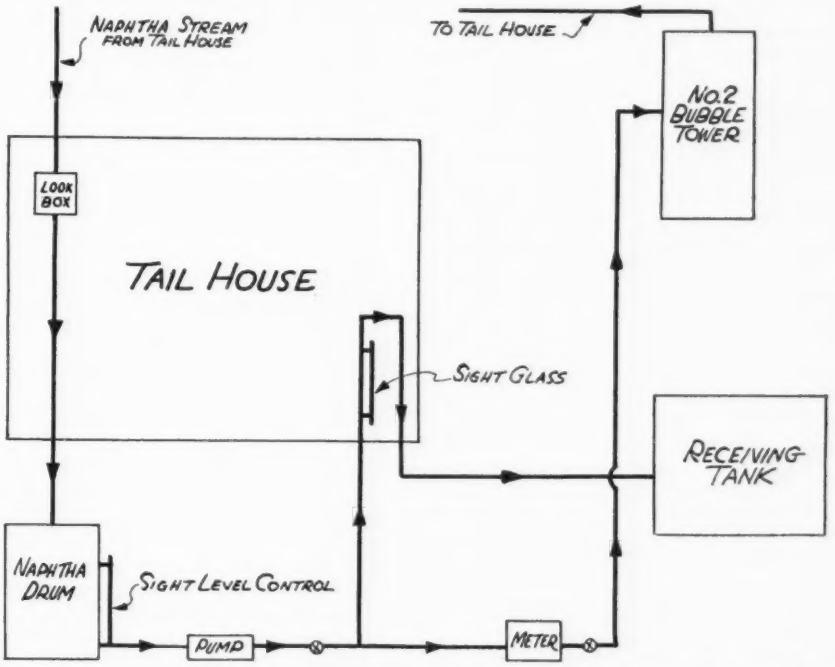
The absorption apparatus for the recovery of gasoline from uncondensed vapors is very simple. It consists of a tower 18 feet high and 18 inches in diameter fitted with liquid sealed baffles. This tower is shown in an accompanying photograph. Vapors are picked up from the lookboxes and condenser coils by a steam driven blower and passed into the bottom of the absorber tower.

This tower is so designed that, instead of the gases passing upward countercurrent to a shower of naphtha, they have to bubble up through a solid column of naphtha on each baffle plate, giving exceedingly efficient absorption.

The stripped gases escaping from the top of the tower can either be vented to the air or led to the boiler and still furnaces for fuel. The blend is continuously drawn off from the



The absorption plant at the Zilwaukee refinery of the Standard Oil Co. of Indiana. Gases captured from the lookboxes and the condenser boxes are passed through this column in such fashion that they have to bubble through a column of naphtha. The lowest line seen entering the tower is an overflow pipe to carry surplus naphtha to the sewer in case the lower became plugged and filled with naphtha. This is to prevent the possibility of naphtha being carried to the burners under stills and boilers with disastrous results. The gas line is so arranged that the stripped gases can either be vented to the air or carried to the furnaces



Flow sheet showing how naphtha stream is pumped over top of No. 2 tower when starting up the still battery at plant of Standard Oil Co. of Indiana at Zilwaukee, Mich.

bottom of the column to a receiving tank, its flow being regulated by a liquid level control operated valve.

There is a liquid vent line with a trap flanged into the side of the tower near the top below the gas outlet so that, in case of the blend outlet becoming clogged and the tower filling with naphtha, it would be drained off to the sewer instead of flowing through the gas outlet lines to the burners, with disastrous results.

The boiler plant consists of two small marine boilers. These were bought by the company from Henry Ford who took them out of one of the shipping board cargo steamers he bought after the war. They are fed with water at about 210 degrees F. which is heated by exhaust steam. The boilers furnish steam for driving the pumps, air compressor, blowers and for the stills, both of which are fitted with steam spiders.

Water for all purposes comes from the Saginaw river. There is a water station on the river bank equipped with two electrically driven centrifugal pumps capable of delivering to the refinery 1200 gallons a minute through the 10-inch water main.

The plant has a loading rack for handling shipments of products out of the plant. But when it was designed the Muskegon field had not yet begun producing crude. There was nothing to indicate that crude oil would ever be coming into the refinery by tank car.

But it is coming in now and it is quite a problem to take care of loading out products and unloading crude on a rack designed for only one of these operations. The crude from the Saginaw field comes into the plant through the company's own pipe lines.

Fire protection is good at the plant. On all gasoline and crude storage tanks are Oceco vent valves and flame arrestors. There are eight fire hydrants scattered about the plant. Each is enclosed in a wooden house elevated well off the ground. Fire hose is kept connected to each of these hydrants all the time and it is kept on racks so that it is dry and always in good condition, in addition to being easily accessible. The houses are self-ventilating, being open at the bottom and having a vent all around the eaves.

The plant has a portable foamite mixer with a generous supply of the powder, and three hose carts. The refinery employs 19 men.

A concrete separating basin into which the plant sewer empties, skims the oil off the drainage water before it is turned back into the river.

Excellent construction marks the plant throughout. For instance, the steel work supporting the towers above the stills is all encased in concrete to prevent failure of the supports in case of fire. However, the buildings are of such materials as transite and Celotex, so that in case it became necessary to move the plant the loss on buildings would be slight.

A. H. WHITE
New vice-president in charge of sales of Indian Refining Co., Lawrenceville, Ind.

A. H. White is Indian's New Vice-President

CLEVELAND, June 16.—A. H. White who recently was elected vice-president in charge of sales of the Indian Refining Co., Lawrenceville, Ill., joined the Indian in 1921 as manager of retail sales. Two years later he became assistant manager of station sales and in 1924 assistant sales manager. Later he was made acting sales manager and for several months has been in full charge of the selling organization.

B. H. Anglin, who has been sales manager, is devoting his time to developing new lubricating oil processes for the Indian. His title is vice-president in charge of manufacturing. Dr. Frank Fritts, the company's other vice-president, devotes his time to management, corporate and financial affairs.

The Indian has its own bulk plants in Indiana, Illinois, Kentucky, Michigan and Ohio through which it distributes Indiana gasoline and Havoline oil. The oil is distributed throughout the world through exclusive franchise arrangements.

Colombia Suspends New Petroleum Law

WASHINGTON, June 15.—Enforcement of Colombia's recently enacted petroleum law has been temporarily suspended, Commercial Attache Bert L. Hunt, Bogota, has cabled the Department of Commerce, pending outcome of consideration of its constitutionality.

Ownership and right of exploitation of petroleum on public lands has been reserved to the government and any oil drilling without governmental permit prohibited by the law, whose enforcement had been ordered recently by the minister of industry in a circular telegram to Colombia officials.

On its enactment petitions had been made to the Colombian government by oil concessionaires in that country protesting that the law was unconstitutional.

Good Roads Building Is Boon to Asphalt

WASHINGTON, June 16.—The demand for good roads has proved a boon to the asphalt industry. Asphalt finds its chief use in paving and, while subject to keen competition from both concrete and coal tars, its consumption has increased. This is reflected in the statistics of the industry covering 1927 as compiled by G. R. Hopkins, United States Bureau of Mines, which record total sales of asphalt and asphaltic materials manufactured from petroleum of 3,951,450 short tons, an increase over 1926 of 14 per cent.

Of the total sales in 1927, 1,525,420 tons, or 39 per cent, was reported as having been produced from domestic crude petroleum and 2,426,030 tons, or 61 per cent, from foreign petroleum. This represents an increase in the proportion manufactured from domestic crude petroleum over a year ago, which may be attributed to a decline in the use of Mexican crudes.

The average value of the sales of manufactured asphalt in 1927 was $13.87 a ton as compared with $13.46 in 1926. The average value of the asphalt manufactured from domestic crude petroleum was 6 cents a ton higher than a year ago, that from foreign crude petroleum 70 cents a ton higher.

Paving asphalt of the solid and semi-solid class was again the chief variety of asphalt manufactured, comprising 42 per cent of the total output in 1927. The roofing and waterproofing branch of the industry used well over 1,000,000 tons of petroleum asphalt in 1927 and in doing so showed a larger percentage increase over the previous year than even the paving asphalts.

Sales of natural asphalt and related bitumens, including bituminous rock, gilsonite, wurtzilite (elaterite), and ozokerite, at mines in the United States in 1927 amounted to 839,040 short tons, valued at $5,819,600. Sales of bituminous rock, the chief product of this group, amounted to 796,100 short tons, valued at $4,672,280, representing an increase over 1926 of 18 per cent in quantity and $0.52 a ton in average value. This material gain over 1926 resulted chiefly from increased developments in Texas, where sales for the first time in several years exceeded those of Kentucky, the other important producing state.

You could eat off the floor at this station in Cincinnati's restricted residential district. Observe Pure Oil Co.'s station man draining the pump hose in prescribed fashion.

Decoration and Extra Pay Given Station Salesmen for Merit in Service

By Ward K. Halbert
N. P. N. STAFF WRITER

CINCINNATI, June 16

UNIFORM service at filling stations is a big help in building repeat business, and therefore desirable, but "try and get it." How can an oil marketer take a small army of station salesmen and train them all to do the same thing in the same way at every station at all hours of the business day?

Preaching to the men does not accomplish it. Making them read sales manuals has but little effect. Personal contact work by a supervisor, or a supervisory group, helps a great deal but even that is not the solution because in every organization there will be some valuable men who seemingly can't get the idea or will not carry it out.

Pure Oil Co., at least in the Cincinnati division, is doing it with a merit system comparable to the one used in the United States army. Military terms are not used and there is no semblance of army discipline, but in true military fashion men of exceptional worth are distinguished with a badge of honor which carries with it additional pay and no extra duties or responsibilities.

The merit badge is a brass shield about 1½ inches in diameter and carries the bold inscription "Master Service." It is supposed to be worn on duty. It fastens to the bosom of the unionalls with a pin and it means that the wearer performs the company's prescribed service to motorists in a manner that is satisfactory to the management. It also means that he draws 2½ cents an hour in addition to his base pay.

There is no secret at all about how a man may get this distinction. It is not won by making a large amount of sales, by keeping his losses down, or by keeping his station clean. These things are handled another way. The badge is won by excelling in station service—by treating Pure Oil customers like the management wants them treated. Every man is checked occasionally to see if he is doing it.

The idea originated with Norman B. Curtice who is in charge of Pure Oil Co.'s operations in Cincinnati. He has had it in force for about two years and is satisfied with the experiment. Inspection work is done by M. C. Langdon, station supervisor. The men understand that they are checked up secretly and visited unexpectedly by Mr. Langdon at any time of the day or night. And they know that their merit badges are contingent upon their treatment of the trade.

Two proud members of Pure Oil Co.'s Ciincinnati sales force throw out their chests and exhibit the markers that testify they serve the trade as trade should be served

THE service feature of the men's work is not complicated at all. The company's demands are few and easy to understand. They are not, however, so easy to carry out. They require tact, speed and a working knowledge of automobiles.

"We want our customers to drive out of our stations with the positive assurance that they have the essentials of motoring," Mr. Curtice said. "The essentials of motoring are gasoline, oil, water and air. Any customer is assumed to want gasoline when he enters the station. In addition to that our men are expected to see that he has the right amount of oil, the correct amount of pressure in his tires and a radiator full of water.

"We do not go in for wiping glass

or polishing brass. We are not conducting automobile laundries. Our purpose is to sell gasoline and oil. If a customer's windshield is dirty and obviously needs wiping the station salesmen may do so if they have time. If the customer asks a man to wipe off the glass he does it, of course. But we do not demand that of them and that is not a part of 'Master Service.'

"Our men try to serve customers any way they can. They help change tires and they might even make some minor repair like adjusting a fan belt, but we are not in that business. Our men are instructed to excuse themselves from any such task to wait on any other customer who comes into the station to buy something."

"BUT the instructions about oil, water and air are mandatory. The station salesman must examine those things on every car that comes in if he obeys instructions. We believe motorists will buy oil if they are shown they need it, so we do not urge them to buy oil except to show them they need it. The salesman lifts the customer's hood, removes the oil gage and wipes it, puts it back in the crankcase to record the oil level and shows it to the customer, either telling him the oil level is safe, or advising him to replenish. If it is obviously thin and black he recommends a complete change.

"A man's activity examining oil and supplying water can be watched from a great distance without his knowledge. He may be watched for a few minutes or an hour at a time, or even two or three hours. A new man is not recommended for a service badge on the strength of one check-up, nor is an older man who has a badge likely to lose it after any single check-up. One check-up is not considered thorough if it does not cover the man's service to 10 or more cars.

"However, if a new man is checked several times and shows that he is willing and able to give 'Master Service' he can be awarded a badge in two weeks after he begins to work. But in order to keep it he has to keep up the good work. He is checked occasionally anyway, no matter how long he stays with the company, and if the quality of his work deteriorates his badge is 'lifted.'

"If a merit man's service begins to go down in quality he is always called in and questioned before his badge is taken from him. We try to learn what the trouble is and help him remedy it because any man who knows our way of doing things is more valuable than the ordinary run of replacements, at least for some time.

"Occasionally it develops that a man is sick, in which case we make allowances for him and help him get well. Sometimes a man is depressed by family difficulties or financial misfortune, and in those cases he is advised, encouraged, helped or reprimanded as circumstances seem to justify, in order to restore him to a frame of mind that will enable him to be as useful as when he won his badge.

"After a second reprimand a merit man has to give up his badge for not carrying on as he started. He can win it back but it is difficult. However, the 'lifting' of a badge sometimes improves service in a general way, just as 'breaking a corporal' sometimes tones up the morale of a military company's whole noncommissioned personnel."

There are service station men in Pure Oil's Cincinnati sales force who have served the company for years and never have acquired a merit badge. They were there before the system went into effect and, although they are valuable men, they have not adjusted themselves to the water, air and oil service system and it costs them 2½ cents an hour. On the other hand some newer men who make less money have been "decorated."

IT MUST be understood that Pure Oil's service station men do not all draw the same base pay. As in most any oil man's organization, there are some men who draw more salary than others. New men start out at 35 cents an hour and they can earn as much as 50 cents. There is a long day and a short one, but the average working day is eight hours. And any wage from the highest to the lowest may be augmented with certain sales commissions. The man who wears a badge draws 2½ cents in addition to whatever his base wage may be.

Under the system, as far as it affects a new employe, the master service badge is the first raise in pay he may expect to get. Until he has learned to do things as the management wants them done he is not subject to increases in pay. If he fails to acquire the habit in a reasonable length of time he is dismissed, without wasting much of his own time and that of the company.

On the other hand, if a new man quickly lines up with the company's service method he is encouraged promptly with a master service badge. The decoration ceremony is simple. Mr. Langdon usually visits the fortunate man at his station, gives him the shield, tells him he has earned it by giving master service and adds that the management hopes he never has to give it up.

Of course, this is not the man's last wage increase if he keeps on complying with the company's wishes. On a service station job, it is possible for any man to earn 52½ cents an hour, counting the pay for master service.

"It is not a prize system at all," Mr. Langdon said. "All work and only a few win in a prize contest. But in this, all can win. We wish every man we have were a merit man. In fact we wish every man in all the 26 stations were the kind that earns 52½ cents an hour."

Bonuses for sales ability are handled by a simple commission system. The more of certain commodities a man sells the larger his monthly commission check. It is possible for an undecorated man of small pay to receive the largest commission check but, as a matter of fact, it seldom happens. The men receive their commission checks between the 20th and 25th of each month for the foregoing month.

The commissions paid on certain commodities are subject to change in certain details but here is substantially the commission arrangement as it stands now: Per gallon of motor oil, 5 cents; 1 per cent on coupon books; 2 cents a pound on greases and soaps; 2 cents a gallon on alcohol, and 1 cent a gallon on kerosene.

An inspection system is carried on to maintain cleanliness of service stations. When Mr. Langdon visits a service station he inspects it and that may happen any time. Usually the inspection tour takes place about once a week. Mr. Langdon carries a pad of small white sheets of paper in his pocket on his inspection tours. Along the left-hand edge of each sheet are printed 33 items. They run alphabetically from Air Towers to Window Sills and embrace every thing that needs attention from the concrete drive to the flag.

As he inspects the station Mr. Langdon checks the items that need attention, and when he has finished he removes the original and a duplicate sheet from the pad. He keeps the original and leaves the duplicate on a hook at the station. This sheet is taken into consideration when the next inspection is made.

Mr. Curtice boasts that a fastidious person could eat off the floor of most Pure Oil stations in Cincinnati and points with pride to the record of cleanliness at some of the older stations where the brass fire extinguishers have been polished so often the lettering on the outside can hardly be read.

Skinner's 19th Year Book Out

CLEVELAND, June 15.—The nineteenth annual edition of the Oil and Petroleum Year Book, formerly known as the Oil and Petroleum Manual, has been published by Walter E. Skinner, London, England. The change in name from manual to year book has been made to indicate more clearly the nature and contents of the book and that it is an annual publication.

The book contains 430 pages of pertinent information concerning 588 oil companies including producers, refiners, pipe line and steamship carriers and oil finance companies operating in all parts of the world.

Refinery Treating Costs and Losses Reduced by Circulating System

By J. C. Chatfield
N. P. N. STAFF WRITER

PONCA CITY, Okla., June 16 THE Ponca City plant of the Empire Oil & Refining Co. has reduced treating costs and losses materially by installing a 3200-barrel batch agitator of the latest engineering design. This agitator is equipped with a pump recirculating system, a vapor tight roof with explosion doors, steam-foamite smothering lines and tail gas plant connections.

The agitator combines all of the advantages of a continuous treater without the difficulties of retreating which occasionally bother operators of continuous units.

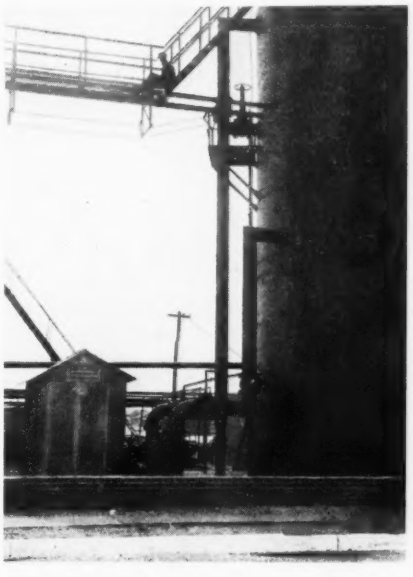
Air blowing, the old standby for proper mixture of chemicals and gasoline, has been avoided by use of the circulating pump. The circulating system has cut treating evaporation losses in half as compared with old methods. Of the vapors in the new agitator at least a third are condensed at the tail gas plant and the remainder are burned under the boilers.

The circulating pump is a Gould 12-inch suction, 10-inch discharge, 3350 R.P.M. centrifugal pump which takes suction on the bottom of the agitator and discharges over the top through a spreader plate. A 75 H.P. 1150 R.P.M. electric motor directly connected to the pump furnishes the motive power.

A 12-inch draw-off line leads from the bottom of the cone and a second one leads from the center of the agitator just above the cone's point of largest diameter. Both enter a manifold from which suction is taken by the pump. In its operation the pump mixes the gasoline and chemicals and then discharges them through the spreader plate fastened into a spider which is welded to the 10-inch discharge line in the top of the agitator. Besides its use for circulating the gasoline and chemicals this pump is manifolded so as to allow it to charge and empty the agitator.

Explosion doors on the roof are equipped with angle iron bumpers which allow the doors to open and release the pressure, but hold the doors in such a position that the force of gravity closes them when pressure within the agitator is dissipated. These doors, together with the steam and foamite smothering lines, form effective safety devices and have demonstrated their usefulness two or three times when fire, following an explosion, was snuffed out quickly with little loss.

The treating operations are simple and with rigid laboratory control enforced, products of uniform quality are guaranteed. The gasoline is blended to gravity and distillation specifications in a 5000-barrel tank just before treating. From there it is pumped to the agitator by the circulating pump where accurately measured quantities of chemicals are added.



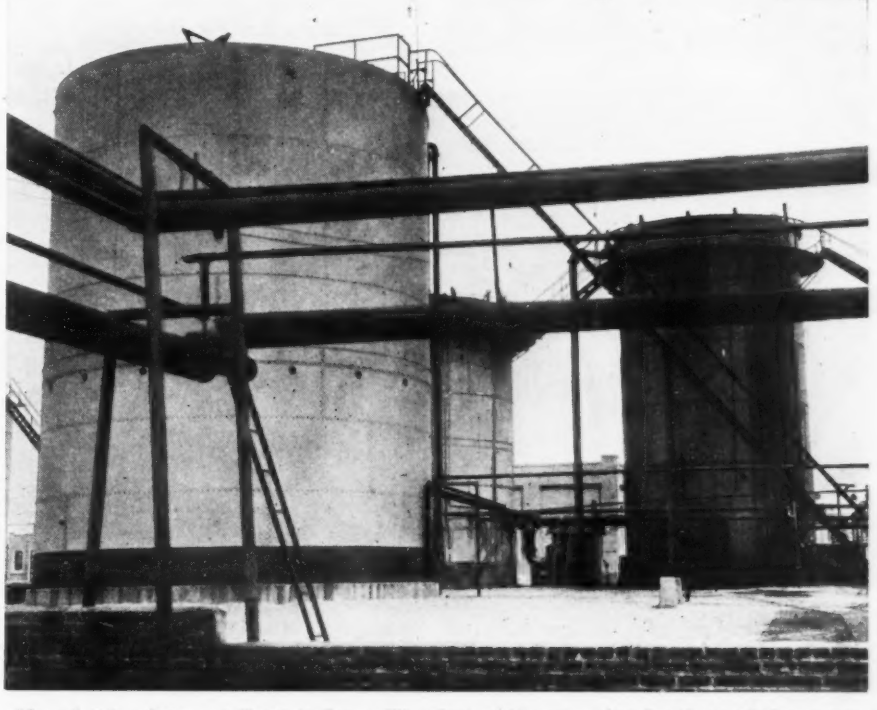
Circulating system connections to agitator at Empire's Ponca City plant. Motor is housed in small building at left

The circulating system then is started and suction is taken from the two points in the agitator as indicated in the accompanying diagram.

The suction line from the bottom of the cone carries the chemicals and is equipped with a by-pass valve to give more accurate control and an even flow of chemicals through the pump during the circulating period.

The average treat of gasoline from Kansas and Oklahoma crudes run at the Empire's plant takes approximately 15 minutes for complete contacting between chemicals and gasoline. After 15 minutes of circulation the treater obtains a sample and submits it to the laboratory for tests. It is then non-corrosive by the copper strip method, doctor sweet, with a low gum content and of good color.

After the circulating is finished



Three batch agitators at Empire's Ponca City plant which are equipped with circulating systems

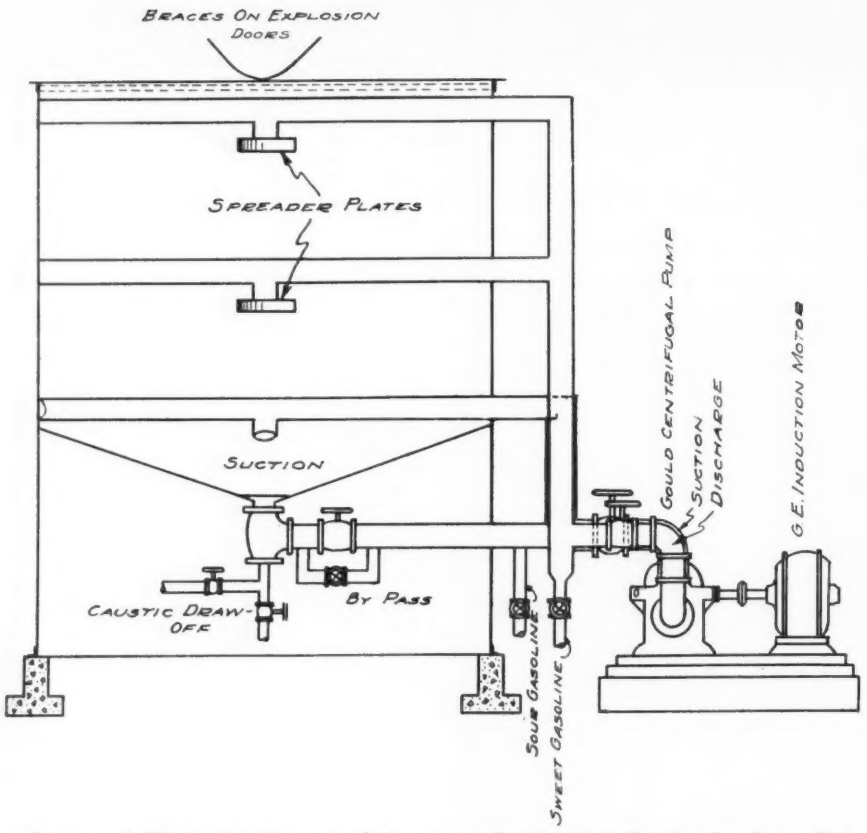


Diagram of 3200-barrel agitator circulating system Empire Oil & Refining Co., Ponca City

the chemicals are allowed to settle out in the usual manner, sludge is withdrawn, the gasoline is washed with water by the circulating system and finally the finished gasoline is pumped to storage or to the loading rack. The single agitator can handle up to 10,000 barrels of gasoline a day.

The Ponca City plant of the Empire is a 7500-barrel complete refinery running down to wax and equipped with two types of cracking processes. Recently a compounding house was built which embraces several unusual features.

To reduce the number of tanks that would be required to store the many grades of oil which may be required by Empire customers, the company blends most oils as they are needed. Basic oils required in blending are stored in 12 80-barrel tanks at the top of the compound house. Mixing kettles of various sizes are just beneath the basic oil storage tanks so that they may be charged by gravity. It is possible to blend batches of 10 to 80 barrels at a time with this system.

From the compounding kettles the oil flows by gravity to the filling platform on the floor below. Fill lines are 6-foot lengths of flexible hose with nozzle control. There are separate lines from each kettle and no manifolding to cause possible contamination.

Tank car lots of oils are blended in special tanks outside the compound house.

Kinney and Blackmer rotary pumps are used for all oil transfers. These are on the ground floor but are automatically controlled from any part of the compound house. An ⅛-inch line connected from the discharge of each pump actuates the pump cut-off at a pressure of 90 pounds per square inch. The closing of a valve at any part of the building almost instantaneously stops the pump charging oil through that line.

A Kinney rotary pump capable of pulling a suction equal to 26 inches of mercury is used for bright stock transfers. It has been found satisfactory in pumping bright stock even in the coldest weather.

Willock Opens Chicago Office

PITTSBURGH, June 15.—A branch office in Chicago has just been opened by the Willock Oil Corp., of Pittsburgh. Hortus A. Scott, formerly with the Acme Petroleum Co., Chicago, and previous to that eastern sales manager for the Imperial Oil Marketing Co., Tulsa, is in charge. The Chicago office was opened to give personal and more efficient service to trade in that territory. It is the first of several district offices the company plans establishing.

Invites Jobbers To Convention

BLOOMINGTON, Ill., June 16.—The fourth international sales convention of the Williams Oil-O-Matic Heating Corp. will be held here June 25 and 26. Oil jobbers and marketers have been invited.

Col. Stewart Acquitted In Contempt Case

WASHINGTON, June 18.—Acquittal of Col. Robert W. Stewart, chairman, Standard Oil Co. of Indiana, of the charge of contempt of the senate by refusing to answer questions put to him by its committee on public lands, paralyzed the tongues of official Washington. No one observed, as in the case when Harry F. Sinclair was found not guilty, that it was hard to convict a million dollars. Senator Norris is reported to have repeated it but there is doubt about it.

Broadly speaking, there was no dispute about the fact that, in terms, Col. Stewart refused to answer the questions put to him at the time they were asked. But Col. Stewart made the point that they were not pertinent, although later he answered them. Justice Bailey, in his charge to the jury, left that body nothing to pass upon except as to whether Col. Stewart was called, took the oath, answered some, and refused to answer other "pertinent" questions.

Under the law the jury is officially inarticulate. It has no duty to the public to tell why it voted as it did. By agreement the jurors in the Stewart case, which returned the verdict of not guilty on June 14, decided not to talk about their verdict. They reached it on the third ballot, after being out 20 hours and being locked up over night. Four women were members. No one would tell how the women voted on the various ballots. On the last, of course, they voted not guilty. On the first ballot the jury's vote stood five for acquittal and seven for conviction. On the next it was nine to three in favor of acquittal. It was locked up for the night after the second ballot.

Col. Stewart smiled an expansive smile when the jury freed him but he had nothing to say for publication. He telephoned his wife and arranged to leave the city immediately. Government lawyers, also, were not inclined to talk.

University Fuel Course Continues

NEW YORK, June 16.—A second year of a comprehensive and practical one-year graduate course in fuel engineering has been announced by the University of Pennsylvania at Philadelphia. This course includes such major subjects as fuel resources, mining methods, composition and combustion of fuels, manufacture of special fuels, uses of fuels and specifications for purchase, furnaces, fuel sampling, analysis and calorimetry, fuel testing in heating and power appliances, domestic heating—cooking and smoke elimination—regulations affecting use of water power and of fuel resources, research problem including thesis and general electives.

State Commission Approves Little River Proration Plan; 85 Wells to Start

By J. C. Chatfield
N. P. N. STAFF WRITER

TULSA, June 18

THE 2000-acre block of proven territory in the South Little River district of greater Seminole will be a hive of industry during the next 60 days. Under an order just issued by the Oklahoma state corporation commission one well may be drilled on each 20-acre tract in the district.

Scouting reports collected June 16, the day after the lid was tilted officially, showed 43 operations begun by cellar diggers and rig builders. Present indications are that approximately 85 wells will be started in time to reach the sand by around Aug. 15, the date on which production may be taken under the agreement approved by the corporation commission. The official date on which wells may be spudded is June 25.

The corporation commission's order did not vary from the plan of proration developed by the operators' committee in conjunction with Umpire Ray M. Collins. It provides that two wells may be drilled in the South Little River district on each 40-acre tract or one to each 20-acre tract. Wells now producing in the district will be limited to 100 barrels a day while the new wells are drilling.

In case any of the newly permitted wells are completed before Aug. 15, they are to be shut in completely until that date. Between Aug. 15 and Nov. 1 each 40-acre tract will be permitted to produce a maximum of 1600 barrels a day. Twenty-acre tracts may produce 800 barrels a day. After Aug. 15 the drilling restrictions of two wells to 40 acres will be lifted but any wells started after Aug. 15 and completed before Nov. 1 must be shut in completely until Nov. 1.

ONE exception to the plan was made. The Blackwell Oil & Gas Co. may drill its northeast corner location in 11-7-6 and on completion produce the well to capacity for 45 days. After that period the 40-acre tract on which the well is located will come under the 1600-barrel proration.

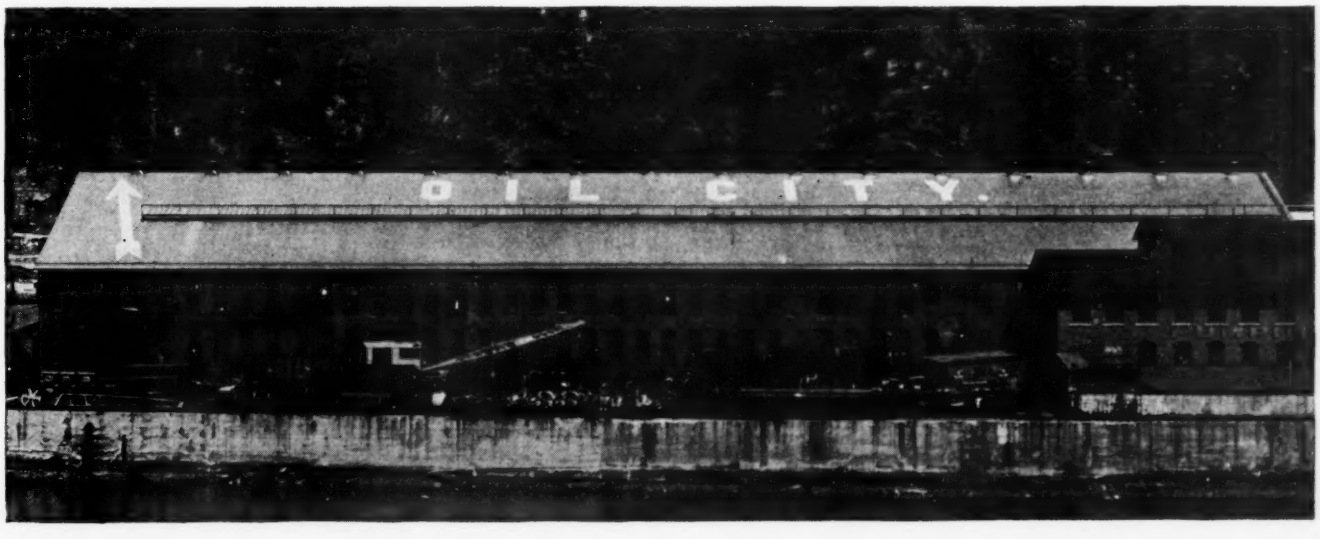
Although two of the operators represented on the committee disagreed with the flat production allowance of 1600 barrels per 40-acre tract, preferring a percentage proration on open-flow tests, neither appeared before the corporation commission to protest at the June 15 hearing. The Champlin Refining Co., which has a 20-acre lease in the NE of 14-7-6 was the only operator to protest.

C. C. Peppers, crude buyer for Champlin, stated his company recently built a 6-inch line to the field connecting with its main 8-inch trunk line to Enid at a cost of something under $1,000,000. Since completion of the line the company has found it impossible to buy crude in the field, major producers reporting that they are not producing more oil than they require. With that situation in mind the company asked to be allowed to produce its lease to capacity to get oil it needs for its refinery. It is possible that some oil may be advanced to Champlin against future production during the proration period.

W. G. Rogers, Rogers Oil & Gas Co., royalty owners, strenuously objected to the proration plan. As an alternative he suggested that the lid be kept on the field or that the proration be on the basis of some percentage of an open flow test.

Rogers stated his belief that the pinching in of Wilcox sand wells drives oil to the edges of the pool and reduces the ultimate recovery of the field. He told the commission

National Transit Pump Co. Guides Aviators



The home works of the National Transit Pump & Machine Co., Oil City, Pa. has joined the movement to letter on roofs of industrial plants directions for flyers. The arrow points to the Oil City municipal airport three miles away. The plant is on the Allegheny river.

that the North Little River pool now is draining South Little River. To prove this assertion he said that before the south wells were drilled in and pinched back the wells in the north section showed a pressure of about 50 pounds while at present this pressure has risen to around 120 pounds.

Witnesses for the operators were Umpire Collins, J. J. Conry, general superintendent of the Carter Oil Co., and R. F. McArthur, vice-president, Barnsdall Oil Co. Mr. Collins told the commission that unrestricted drilling in Little River would develop a large production before fall causing a serious situation.

Both Mr. Conry and Mr. McArthur said their belief was the proposed proration method would be equitable. They pointed out that in the Seminole district edge wells often are more prolific producers than those drilled in the center of the pools.

Combating the plan of a percentage proration the witnesses for the operators stated that such a plan would tend to damage the field. They stated that the tendency of producers would be to drill as far as possible into the sand to establish a big potential. The danger of this, they said, consisted of the probability that some of the wells would be drilled into water.

Thirteen wells in townships 8-6, 8-5 and 9-5 were authorized to be drilled by the corporation commission at a second hearing which followed the Little River case. Nine of these wells are in the vicinity of the Gypsy Oil Co.'s two wells northwest of Bowlegs which have been shut in. Two are adjacent to the Prairie Oil & Gas Co.'s shut in well south of Earlsboro and two are north of Maud in the western tier of sections in Seminole county.

The 13 wells to be drilled under the order are to be shut in to 50 barrels a day and remain shut in until the first well commenced after Aug. 15 is completed as a producing well. Discovery rights are to be protected in all cases. Following is a list of the permitted wells:

Twin State Oil Co.	NW NE NE Sec.	8-8-6
Marland Oil Co.	NE SE SW Sec.	7-8-6
Roxana Petroleum Corp.	NW NW SW Sec.	7-8-6
I. T. I. Oil Co.	SE SE NE Sec.	10-8-5
Gypsy Oil Co.	SE NE SW Sec.	24-9-5
Carter Oil Co.	NW NW Sec.	8-8-6
I. T. I. Oil Co.	SE SW SW Sec.	22-8-5
Prairie Oil & Gas Co.	NW NE NW Sec.	12-8-5
Wilcox Oil & Gas Co.	SE SE SE Sec.	24-9-5
Gypsy Oil Co.	SE SE NE Sec.	1-8-5
Gypsy Oil Co.	SE SE SW Sec.	6-8-6
Gypsy Oil Co.	SW SW NE Sec.	6-8-6
Prairie Oil & Gas Co	SE Sec.	8-8-6

Swiss Visits California Fields

LOS ANGELES, June 18.—Dr. W. Bernoulli, Basle, Switzerland, who recently returned from a year's sojourn in Venezuela in the interests of the Campagnie Financere Belge des Petroles of Antwerp, is spending some time in California, touring various oil fields.

Chicago Dealers Organize Fight Against Alleged Terrorists

Staff Special
CHICAGO, June 18

FINDING the beer running business a little too hot at present, "Scarface Al" Capone, the w.k. Chicago gangster, plans to take an active interest in the filling station business of Cook county, it is said, through an organization known as the Filling Station Owners' association of Cook county, Ill. This was the announcement made at a meeting of the Automobile Associated Trades of Illinois, the established local association of filling station owners, held at the Morrison Hotel, June 14.

Some 50 members of the A.A.T.I. attended the meeting and voted to close their stations for 24 hours, or longer if need be, in protest against this contemplated infringement of their personal liberty and to gain the support of the public and the major gasoline companies in their fight.

For a consideration of $5 down and $5 per month dues (at present) Capone would "protect" all the filling stations enrolled in his organization, according to statements made by several of the members of the A.A.T.I., who said they had been approached by several canvassers of the new organization.

A fund is being raised and the fight will be carried to a finish, said F. H. Avery, president of the A.A.T.I. Rumors were current that Mr. Avery had resigned, but this has been denied by both him and members of his organization.

Leonard Micon, president of the newly organized F.S.O.A., with headquarters at 809 W. Madison St., Chicago, denied any relationship between his organization and Capone. He issued the following statement in answer to the accusations of the A.A.T.I.:

"After noticing the articles published in the press on June 15, I wish to state that Al Capone and Joe Saltis are in no way connected with the Filling Station Owners' Association of Cook County, Ill.

'The Filling Station Owners' Association of Cook County, Ill., is an association formed for the benefit and protection of the Independent gasoline station owners and is not destined to be a racket but is purely a protective and benevolent association."

Leonard Micon is the owner of a filling station and says he never solicited any of the gasoline station owners, nor threatened them with penalties, nor mentioned Capone and Saltis to any of them but attributes statements appearing in the city press to certain persons who want to oppose his association.

"The Filling Station Owners' association of Cook county is to protect its members against unreasonable legislation tending to injure the filling station business and against unreasonable taxation, and also to prevent monopolies in the trade," Mr. Micon says.

The rumor, however true or false, that men whose names are linked intimately with violence, beer running and bomb throwing in Chicago have set about to terrorize the filling station owners and tax them $5 a month, payments to be accepted in the guise of association dues, is sufficient to stimulate serious apprehension in any group.

It has been less than a month since the president of a Chicago garage owners' association was "taken for a ride" by unidentified strangers who forced him to enter their automobile. He was shot and left for dead in the street but the wounds were not fatal.

The "Scarface Al" Capone mentioned in this affair is the same individual who lately was elevated to the dignity of "Big Scare" by the cleaning and dyeing men in Chicago to protect certain interests in the industry against feared violence from an alleged "cleaners' racket" in Chicago. It is generally reported that Capone has been interested in a financial way by owners of cleaning works because they believed Capone and his associates could do for them what the Chicago police department could not do, or at least were not doing.

Keep Bugs Out of Fire Extinguisher Hose

CLEVELAND, June 16.—The petroleum section of the National Safety Council in its current news letter suggests that a paper bag be tied over the nozzle of the hose of 40-gallon foam extinguishers to prevent bugs from crawling inside the nozzle and mud daubers from building their nests in the hose.

The suggestion was inspired by the bursting of a 2½-gallon extinguisher because the nozzle had corroded and prevented the discharge of foam at a fire. This accident was reported in the April bulletin of the Mid-Continent Oil and Gas Association's safety section.

Oil Field Standardization Program Carried Into Final Stages

COLORADO SPRINGS, June 16

IN CONTRAST to previous meetings of the standardization division of the American Petroleum Institute, the session here this week was routine in character.

The program has been so fully carried out—so many final specifications have been adopted—that relatively little remained to be done.

Two committees did not meet at all. These were the boiler and the rig iron committees. Their work has been completed except for revisions in specifications that may some time be made, for which purpose the committees are continued in existence. No business was at hand sufficiently important to call for a meeting now, however.

One by one the other committees are winding up their work, so that future mid-year meetings will be largely devoted, as at the one just closed, to the work of the division of development and production engineering. The standardization committees have forwarded the design of equipment to meet present day development and production problems; the new division will plan for its effective use.

One of the committees on standardization which had a reasonably full schedule this year was that on pumping equipment and engines. Emerging from a two-day conference, T. E. Swigart, of the Shell Co. of California, national chairman of the committee, reported the following accomplishments:

A recommendation to the pipe committee that an addition be made to pipe specifications to provide for a slight reaming of the inside of tubing ends to insure ready passage for plungers or cups.

Minor changes were made in sucker rod specifications. That part of the previous specifications providing for a 30-degree chamfer on the pin end and a 35-degree chamfer on the box recess was rescinded. The committee expected manufacturers would change their practice until a form of pin end and box recess was found which would not be conducive to cross-threading. In a year or two it is expected to replace this specification as a result of information which will be developed.

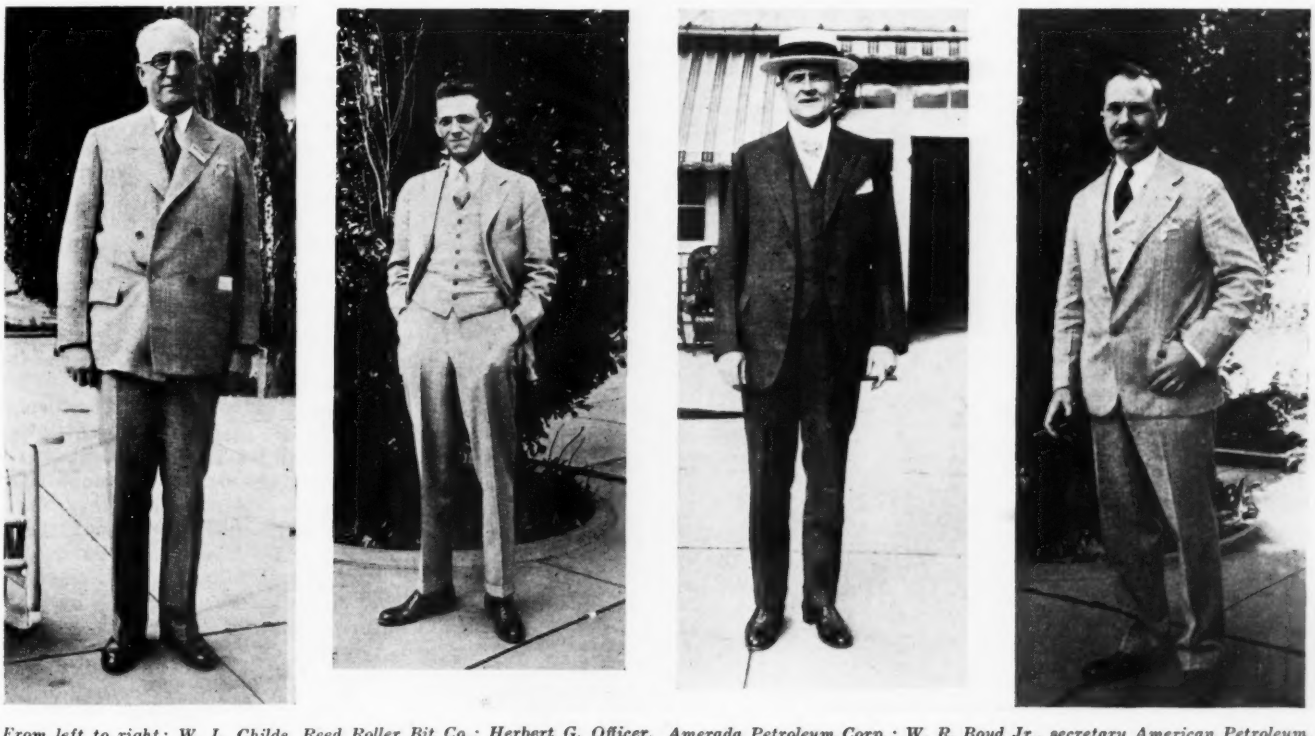
Specifications on the plain end pull rod were rescinded and the only standard pull rod now is the upset or reinforced. Committee members agreed that the design of the latter is much better and that operators are justified, in nearly all cases, in buying the reinforced rod, as the cost difference is small.

Standard rating test forms for single and multiple cylinder gas engines of non-diesel type were finally adopted. Standards were adopted for air intake specifications for gas engines. A standard rating test form for electric motors was tentatively agreed upon and will be proposed for final adoption at the Chicago meeting in December.

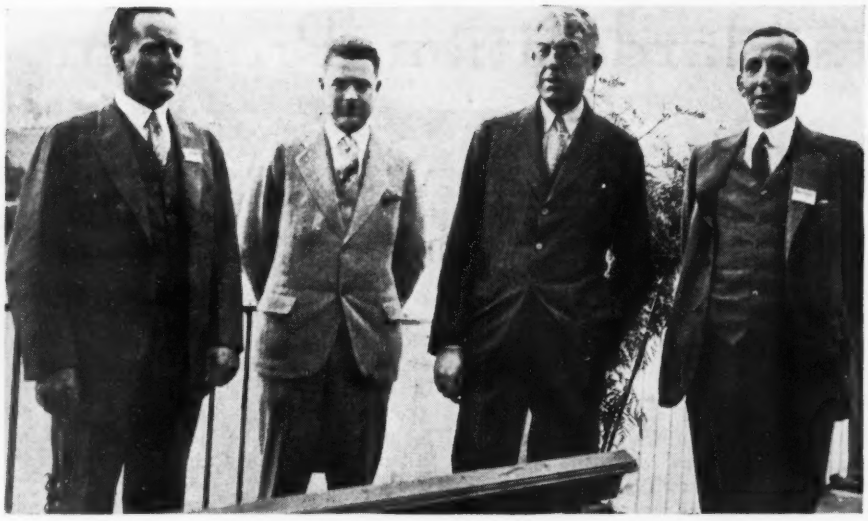
The committee delayed action on standardization of electric motor frame dimensions in the hope that the national committee on motor standardization, sponsored by the American Society of Mechanical Engineers and the National Electric Manufacturers Association would have ready national motor standards which could be considered by the A.P.I. committee.

A TENTATIVE code on care and use of sucker rods has been prepared and given to the chairman of the committee on production technic of the A.P.I. division of development and production engineering. It will be reviewed by that committee before publication.

All specifications on belting have been final since December. The belting committee, headed nationally by A. H. Riney, Phillips Petroleum Co., reported that some difficulty has been



From left to right: W. L. Childs, Reed Roller Bit Co.; Herbert G. Officer, Amerada Petroleum Corp.; W. R. Boyd Jr., secretary American Petroleum Institute; Walter H. Meier, Atlantic Oil Producing Co.



L. N. Slater, Western Pipe & Steel Co., Los Angeles; James F. Kimbell, Gallagher Co., Los Angeles; George T. Horton, Chicago Bridge & Iron Co.; Walter Samans, Atlantic Refining Co. Mr. Slater is chairman of the sub-committee on bolted tanks. Mr. Horton is inventor of the Hortonsphere tank. Mr. Samans is a member of the corrosion committee

had from lack of uniformity of test procedure and lack of care, by some testing laboratories, in making standard A.P.I. belt tests.

Therefore, a standard test procedure has been worked out and a committee appointed to investigate laboratories and work out a plan of approving those competent to test belts according to the procedure adopted.

The manufacturers' sub-committee of the belting committee was requested to submit data on recommended practices for the application of oil field belts, with particular reference to more conservative tables than now exist, for applying oil field belting in practice.

Manufacturers reported to the belting committee that a large quantity of belting is being manufactured and used which complies with A.P.I. specifications, but that few companies are specifying A.P.I. belting on purchase orders. The committee recommended that purchasing agents be instructed to mark all orders for belting "to be manufactured according to A.P.I. specifications."

THE tankage standardization committee got a somewhat later start on its work than did most of the other committees, but it is able now to report that it has caught up with the rest. At the Chicago meeting last December the general design specifications for tanks with riveted shells were finally approved by the Institute directors. Details of design were then subjected to engineering check, by questionnaire method. Final designs for all sizes have now been completed and approved. These have been published in the A.P.I. standardization handbook. On bolted tanks the sub-committee has agreed on the specifications, which are yet to be published.

E. J. Nicklos, Mid-Continent general superintendent for The Texas Co., national chairman of the committee on rotary drill equipment, in a brief report, said that final approval on standard connections for swivel goose necks had been made, as well as on specifications for standard connections for headboards.

Tentative specifications were adopted on 8 and ⅝-inch drill pipe. These will be circulated to the various districts for comment and study and final action will be taken in December.

Recommendations of the California district as to standoff of drill pipe in tool joints at hand-tight bit were accepted for the 6 and ⅝ and 5 and $^{9}/_{16}$-inch sizes. Standoff on other sizes was left unchanged pending further information from various districts.

The 3½ and 2 and ⅜-inch sizes of taper joints were reported by the California district to be not correct, so it was agreed to hold up the gauges on these until further opinion could be developed from other districts.

A special sub-committee was ap-

Carry Standardization Into The Oil Fields

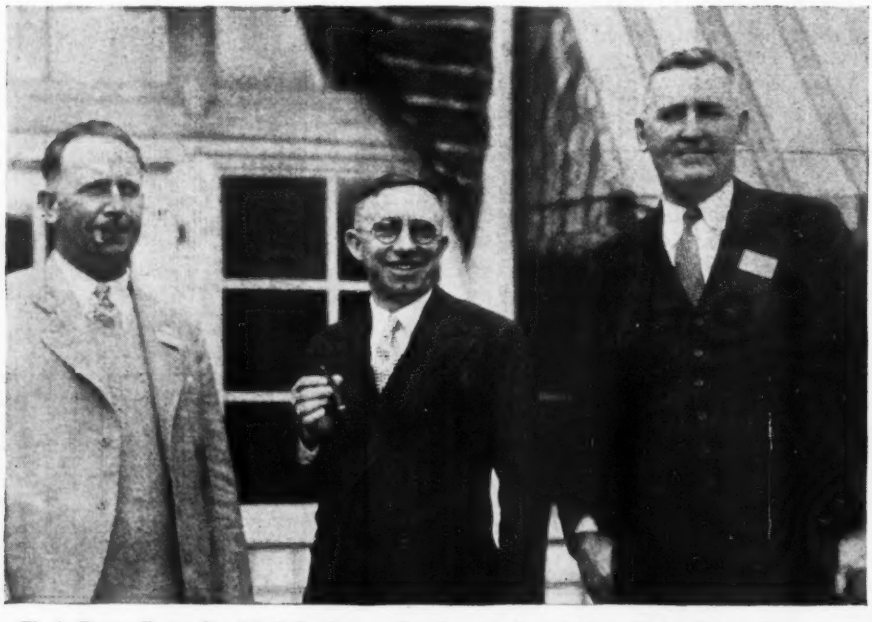
(From the paper on "Adoption of A.P.I. Standard Equipment" prepared by A. W. Peake, president Dixie Oil Co.)

THE new Division of Development and Production Engineering can assist materially in this work. (Education of field men in the use of standardized equipment)—A portion of its meetings can be devoted to explanations and discussions of A.P.I. equipment and the benefits to be derived from its use.

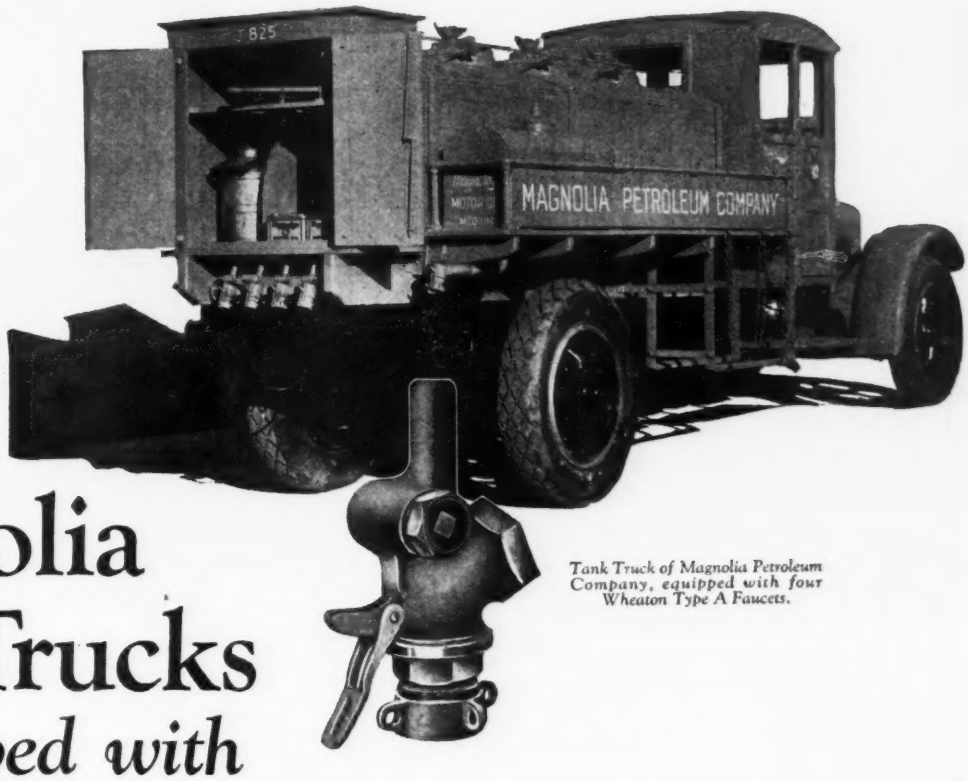
"This is a worthwhile activity for the petroleum engineers. It will do many of them good to gain a better first-hand knowledge of actual equipment and their help to promote adoption of A.P.I. equipment will certainly speed up the work.

"They must always keep in mind that their chief function is to make money for their companies and not simply to work out new ways of doing things regardless of their economic aspects.

"A.P.I. standard equipment is here. Let us sell ourselves on its adoption. If we put into the task one-tenth of the effort which has been expended on the development of the specifications, we will reap the actual benefit of elimination of confusion and saving in expense which was the main object when this great program was started."



W. A. Trout, Emsco Derrick & Equipment Co., Los Angeles; Edward Timbs, National Supply Co. of California; M. T. Archer, National Supply Co., Toledo



Tank Truck of Magnolia Petroleum Company, equipped with four Wheaton Type A Faucets.

Magnolia Tank Trucks *are equipped with* WHEATON FAUCETS

Type 50 Wet Hose Auto-Filling Faucet

Type 60 Filling Pipe Cap

MANY years ago the Magnolia Petroleum Company did what Wheaton always wants every *non*-user of Wheaton Faucets to do—namely, put them through the most exacting TESTS, and let the results determine whether or not Wheaton Faucets are adopted. Let those tests be in practical every-day service or in the laboratory—Wheaton Faucets invariably prove their excellence.

This so-called "sample method" of selling has been the Wheaton policy for nearly twenty years, and it has resulted in Wheaton Faucets being by far the most extensively used faucets on the market today. Such is the evidence of Wheaton *superiority!*

Order a sample of any Wheaton Product—subject to return for credit or refund. That is the way for you to find out for *yourself* just how excellent Wheaton Products are. A catalog will be sent gladly upon request.

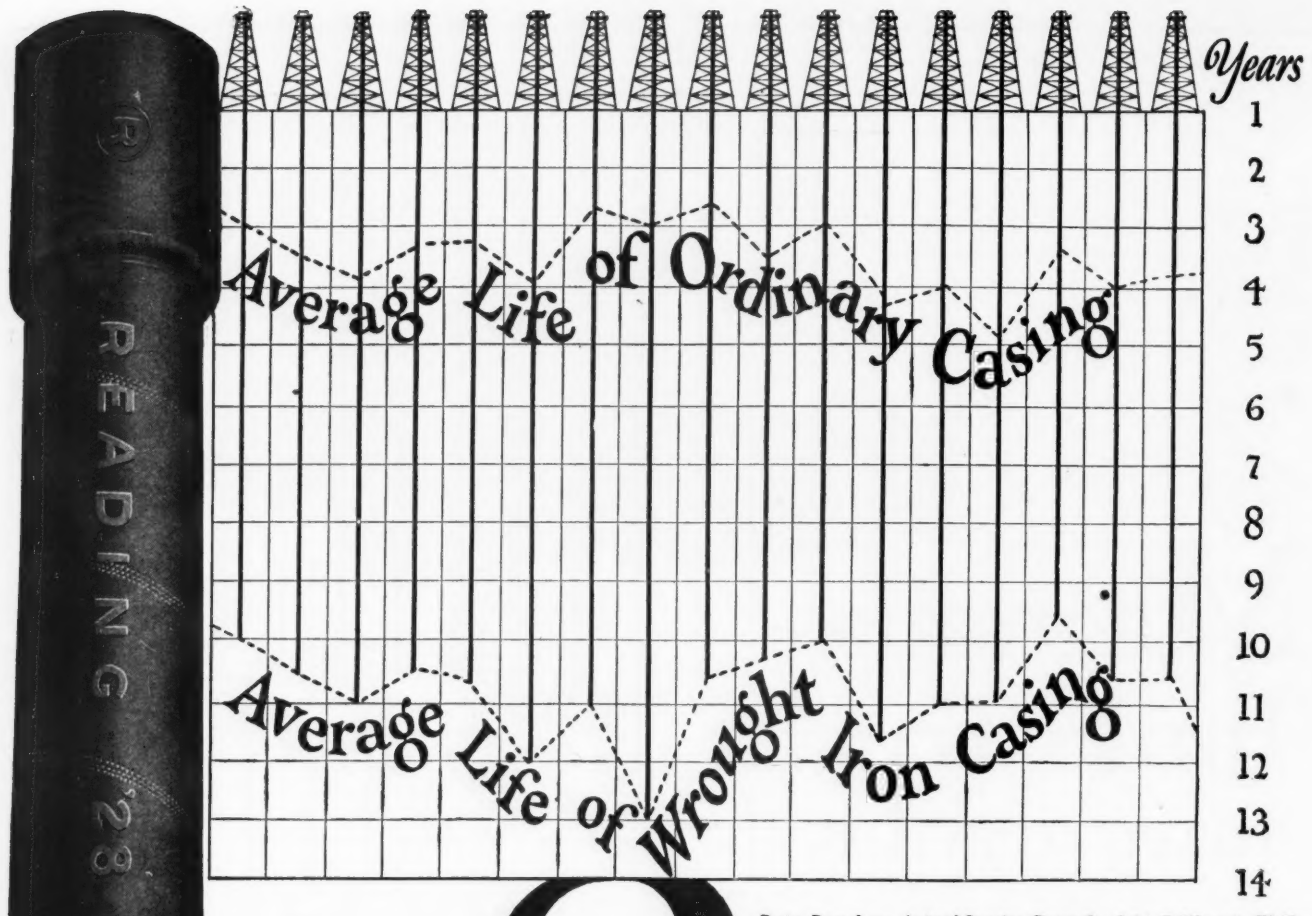
A. W. WHEATON BRASS WORKS, NEWARK, N. J.

Type 0 Barrell Faucet

Type 25 Loading Valve

Empire Brass Mfg. Co., Ltd., London, Ontario—Canadian Manufacturers & Distributors

Wheaton



Data Based on Actual Service Records of 34 California Wells
17 had Wrought Iron Casing 17 had Casing of Other Materials

Has Your Casing A Long Life Line?

GENUINE Wrought Iron Casing, of course, lasted the longest with an average life of ten to twelve years. The ordinary Casing lasted only about four years.

No longer is it necessary to buy casing blindly. Records are now available to determine with a fair degree of accuracy how much service you can expect from your casing, depending on the type of material used.

Wrought Iron resists corrosion—that's common knowledge! By preventing corrosion, it keeps out water—it reduces the number of fishing jobs—it saves you trouble and expense.

All Reading casing, tubing and pipe, unlike all other tubular goods, are DOUBLE Welded, affording greater strength of weld, greater resistance to corrosion and vibratory strains due to denser structure, better thread accuracy and strength.

READING CASING

GENUINE WROUGHT IRON

World's Largest Manufacturers of Genuine Wrought Iron Pipe

READING IRON COMPANY HOUSTON, TULSA, FT. WORTH, SAN FRANCISCO, LOS ANGELES READING, PENNSYLVANIA

pointed to review the code on drill pipe and to prepare field posters. It is expected to include in this code recommendations for reconditioning drill pipe in the field thus to create a better standard for repair work in field repair shops.

For standard rigs and derricks specifications adopted were those proposed at the Chicago meeting last December. Some additional specifications of standard rig parts and headboard connections for rotary draw works were also adopted. National Chairman W. W. Fondren, Humble Oil & Refining Co., made the report.

Recommendations were made that the committees on rig irons and on rotary drilling equipment develop additional standard specifications to facilitate greater interchangeability for the standard rig.

The A.P.I. code of recommended field practice for rigs and derricks will soon be ready for distribution. Several manufacturers have received their licenses to manufacture A.P.I. derricks and rigs.

For the committee on cable tool drilling joints, Thomas Fleming, of the Oil Well Supply Co. reported that his committee had had under consideration the adoption of three smaller size cable tool drilling joints. It developed that it was impossible to determine the extent of the demand for master gauges, so, to avoid the great expense of setting up such gauges, manufacturers interested were notified to make the smaller joints to their own or to the purchasers' specifications.

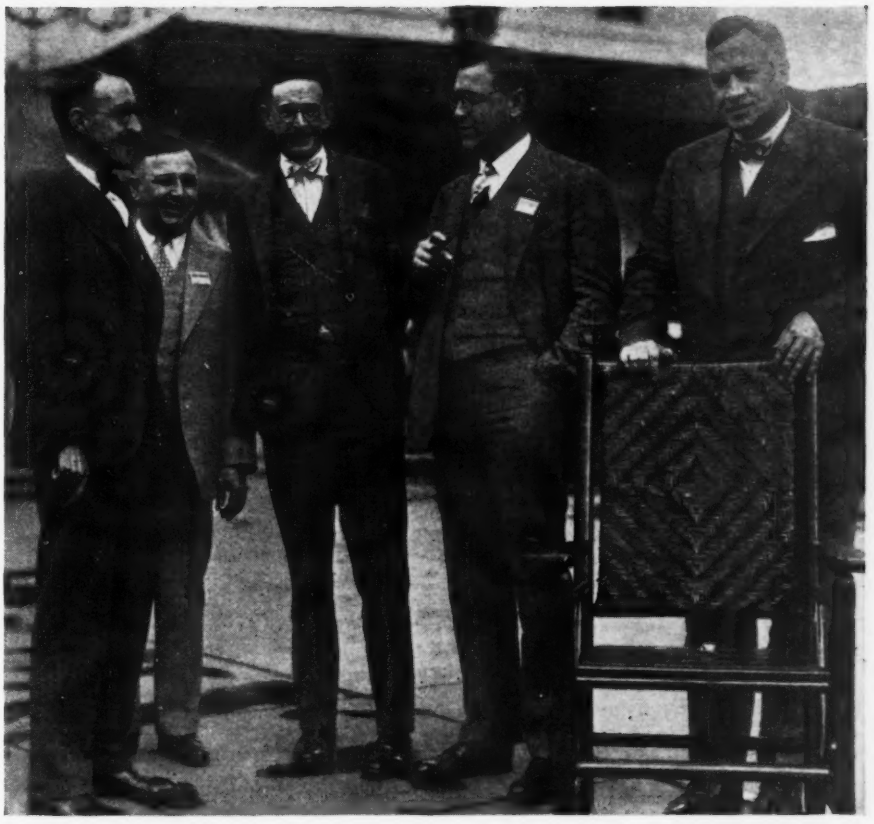
DATA on existing standards of diameters of rope sockets together with recommendations for establishing uniform standards, were offered by a sub-committee. It was recommended that the Dallas office of the Pittsburgh Testing Laboratory be made custodian of the gauges for the Mid-Continent.

The committee provided for an increase in the maximum lengths of the box and pin collars on drilling and fishing jars. This increase will permit re-turning the joints in the field without change in the heat treatment.

It developed that it was considered within the province of this committee to go into the entire jar situation and perhaps develop standard sizes and dimensional standards for jars. It was also considered advisable to make recommendations on sizes for joints to be run in the established sizes of A.P.I. pipe. A sub-committee, consisting of Messrs. Spang, Hinderliter, Williams and Mapes was appointed to go into the subject of jars generally.

After being checked by experts in several lines the code of recommended field practice of cable drilling and fishing tools was adopted. The committee decided that suitable posters covering the essential items of the code should be prepared and properly illustrated.

The work of the committee on oil country tubular goods was reported upon by its national chairman, Charles Fitzgerald of the Pure Oil Pipe Line Co. of Texas.



D. M. McCarger, Allis-Chalmers Manufacturing Co.; F. W. Mohler, International Derrick & Equipment Co.; W. G. Heltzel, Sinclair Pipe Line Co.; Walter Geist, Allis-Chalmers; David Wallace, Western Supply Co., Tulsa

Changes in specification 5-A included the addition of 7-inch, 22 lb. casing, Table 1-A, and the deletion of 24½-inch, 88 lb. casing, Table No. 1. It was decided to add to the specification an illustration of upset casing similar to that shown for upset drill pipe.

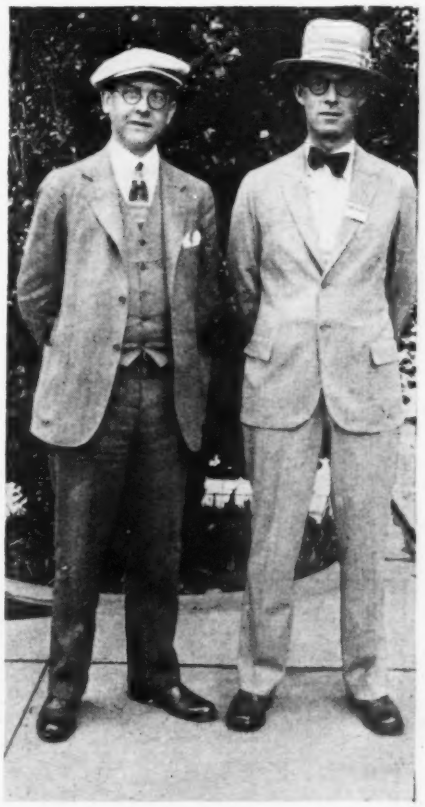
The table of pressures was eliminated from the specifications and added to the code. The basis for the calculation of collapsing pressures is to be changed from .434 to .500.

The decision to require all casing to be shipped with thread protectors was reached by vote of the committee. To simplify the ordering of A.P.I. standard tubular goods a subcommittee was appointed to draw up a special form for the use of purchasers.

The code on care and use of pipe was approved in general. After additions have been made to the code on line pipe it will be ready for issuing in final form.

GENERAL discussion in committee meetings brought out that the standard string of A.P.I. casing is not in general use in any district. It was further learned that A.P.I. casing is being ordered with threads other than those of institute specifications.

The committee urged that the division of development and production engineering undertake a serious study of casing strings to be recommended for various districts, and that it make comparisons of the strength of joint of A.P.I. casing with that of other threads.



Oscar Bieler, Oil Well Supply Co., Pittsburgh, and E. O. Bennett, director of Marland Industrial Institute, Ponca City

Development and Production Methods In West Texas Fields

By Harold Vance*

Presented before Division of Development and Production Engineering, American Petroleum Institute, Colorado Springs, June 15

THE area commonly known as West Texas includes the counties of Winkler, Ector, Midland, Howard, Mitchell, Glasscock, Reagan, Crockett, Upton, Crane, Pecos and Loving. These counties as well as an additional area to the north in Texas and New Mexico, lie in what has been commonly termed the Permian Basin. (See Fig. 1).

The Texas and Pacific and the Orient Railway, as well as two additional transcontinental highways, serve this area.

Regional Features

A large portion of this area is characterized by the sparsity of vegetation. In general, the area is of uniform relief, with occasional ridges of Cretaceous sediment. Sand dunes and caliche cover 50 per cent of the area. Rainfall is slight and not consistent from year to year. The temperature varies from 15 degrees to 110 degrees F. Rapid changes in temperature are common, with high winds and occasional hail storms during the spring months.

Water for domestic and commercial purposes is obtainable throughout the area, with the exception of portions of Crane and Upton counties.

In general, the producing fields occur along the rim of an Old Permian basin in which the normal order of deposition of salts, due to evaporation of water, are present. Bulletin 780-B of the Geological Survey discusses the West Texas area in relation to salt and potash.

The salt beds are thinnest and are often entirely absent in the areas of structural highs. This absence of salt deposits is probably due to the irregular outlines of the basin, or to the presence of structural or topographical highs prior to the deposition of the salt and Anhydrite. There appears to be no definite trend of the fields, but there is a close relationship to the rim of the basin. Surface structures in the Cretaceous are often misleading.

Production occurs in the big lime which lies below the red bed, salt and Anhydrite deposits throughout the basin. The only exception to this, so far discovered, is the Chalk field in Howard county, in which the production occurs from sands in the Red Beds, as well as from the lime itself.

Producing Fields

There are at the present seven fields in West Texas, with a production of over 3,500 barrels each per day. These fields include the following in order of their present and prospective commercial importance:

(1) Hendricks Field, Winkler county.
(2) The Yates Field, Pecos county.
(3) Gulf McElroy or University Pool, Crane county.
(4) The Big Lake Field, Reagan county.
(5) Chalk or Roberts Field, Howard county.
(6) McCamey or Crane-Upton Field, Crane and Upton counties.
(7) Westbrook, Mitchell county.

The Iatan Field in Mitchell county, World Pool in Crockett county, Gulf Waddell Pool in Crane county, the Lockhart Pool in Loving county, the McConnell Pool in Ector county and

*Engineer Marland Production Co.

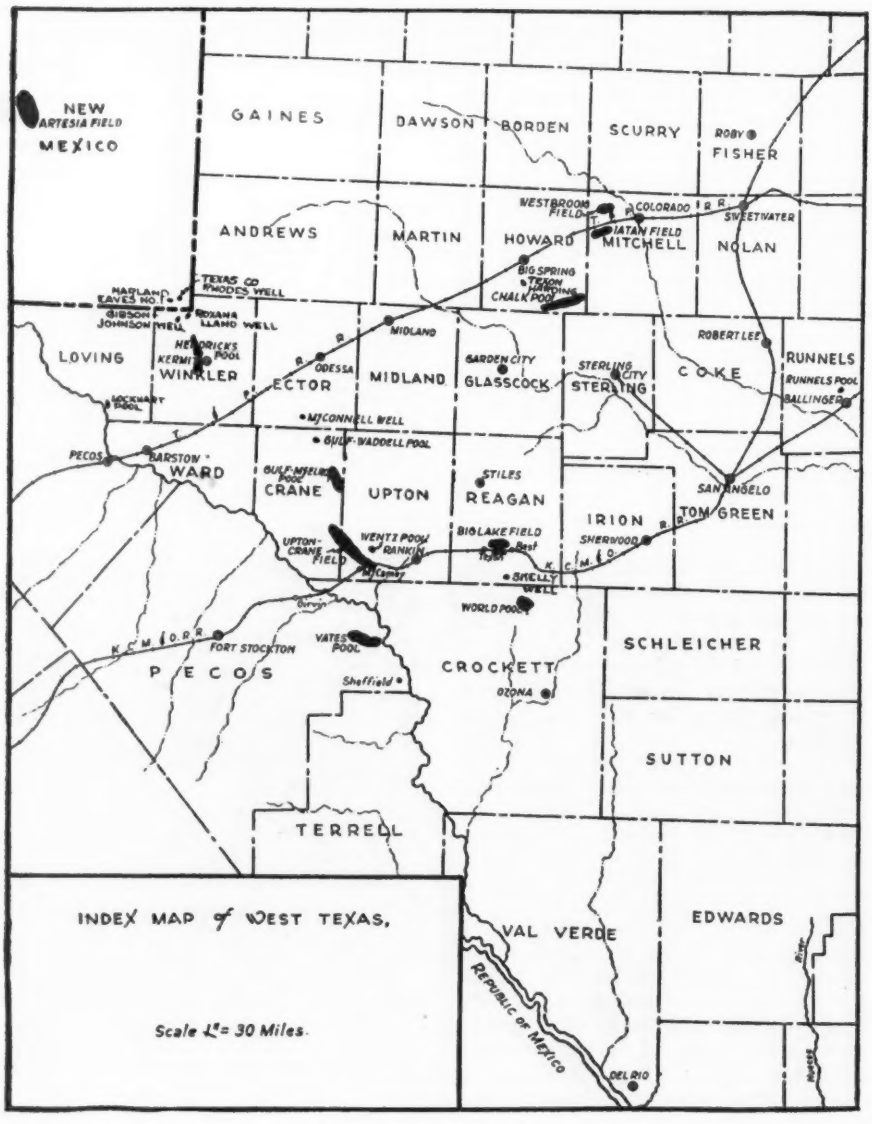


Fig. 1—Map of west Texas showing location of pools, also locations of the new Artesia field in New Mexico

Fig. 9—Installation of pumping unit in gas lift well. Hendricks field

Lea county of New Mexico, are of minor importance at the present time, although some of these fields give promise of developing considerable production.

Area Yet to be "Wildcatted"

Twelve fields of major and minor importance have been discovered in a prospective area of 33,000 square miles. Eighty per cent of these discoveries have been made in the last few years. Surface geology, sub-surface geology and torsion balance, seismograph and magnetometer have been used in locating fields already discovered.

Commercial Importance

Producing fields in West Texas today represent the country's largest known reserve of oil. The entire area represents the best prospective area in the United States.

The high sulfur content of the oil has been responsible for the lack of market and low prices, and has led to a decrease in drilling, thus preventing a number of fields from reaching their maximum production.

The known corrosive effect of the oil and gas delayed the building of storage. Concrete reservoirs are now being constructed, in addition to steel storage.

The lime production is characterized by gas carrying high percentages of hydrogen sulfide, and having low natural gas oil ratio.

The Hendricks field, in Winkler county, is the only field in which a large amount of free gas, under high pressure, is available. This gas represents a commercial possibility in that it could be used for domestic consumption with some precaution taken to eliminate leaks and fumes from burning. It also has a lower hydrogen-sulfide content than any gas so far discovered.

Crane Upton Field

The Crane-Upton, or McCamey, field was discovered in the early part of 1926 and development was very rapid considering the low initial production of the wells drilled. This field marked the westward extension of production in West Texas and results of this discovery lead to increased wildcatting and the discovery of additional fields in West Texas.

Figures 2, 3, 4, 5, 6, 7 and 11 have been omitted in publishing this article because of inability to reproduce them properly.

The discovery well was drilled in Sec. 8, Block R. H. & T. C. Survey, Upton county. Development spread east, then northwest and southeast for 15 miles. The present productive area amounts to 8,000 acres.

Sub-Surface Data

The structure is anticlinal and characterized by local highs with low saddles in which no commercial production occurs. The Independent area shows the most intense folding, and here wells have been drilled with an initial production of as much as 4,000 barrels.

The Lane Pool, near the Orient Railway right of way, has a similar sub-surface condition and has produced wells of high initial production. In these two areas the encroachment of water has accounted for rapid decline in production.

The surface formation consists of lime or sand and for a depth of 600 feet to 800 feet the formation consists of sand stones and Anhydrite, with water occasionally present in the more porous sand stone. The formation below the Anhydrite and sand stone consists of salt with some red shale and Anhydrite. In a few instances small pockets of water have been found in the salt section.

Below the salt section there is 700 feet to 900 feet of Anhydrite with some sandy shale and a small amount of salt and Dolomite. Below this Anhydrite section is a brown Dolomite stratum which varies in thickness from 0 to 40 feet. Under the brown Dolomite is 100 feet of fine silty sand stone. Below this sand stone measure is the big lime which contains some Anhydrite and Bentonite.

Fig. 8—"Bringing In" rotary drilled well after bailing fluid down 400 feet. Hendricks field

Production occurs in the big lime at depth ranging from 0 to 120 feet. The production within the lime itself may be divided into two zones; one occurring from 0 to 40 feet and the other from 80 feet to 120 feet in the lime. The oil in the upper zone has a gravity of 31 degrees A. P. I. Oil from the lower zone averages 28 degrees A. P. I. gravity.

Wells completed in the upper zone are characterized by low initial productions and gradual declines, while

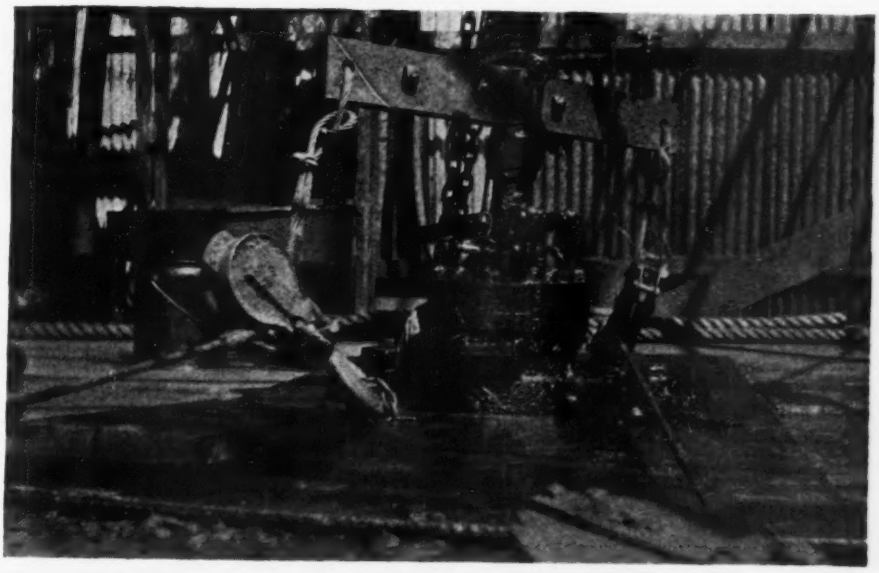


Fig. 10—Installation of Craig high pressure oil saver with snubbing device. Hendricks field

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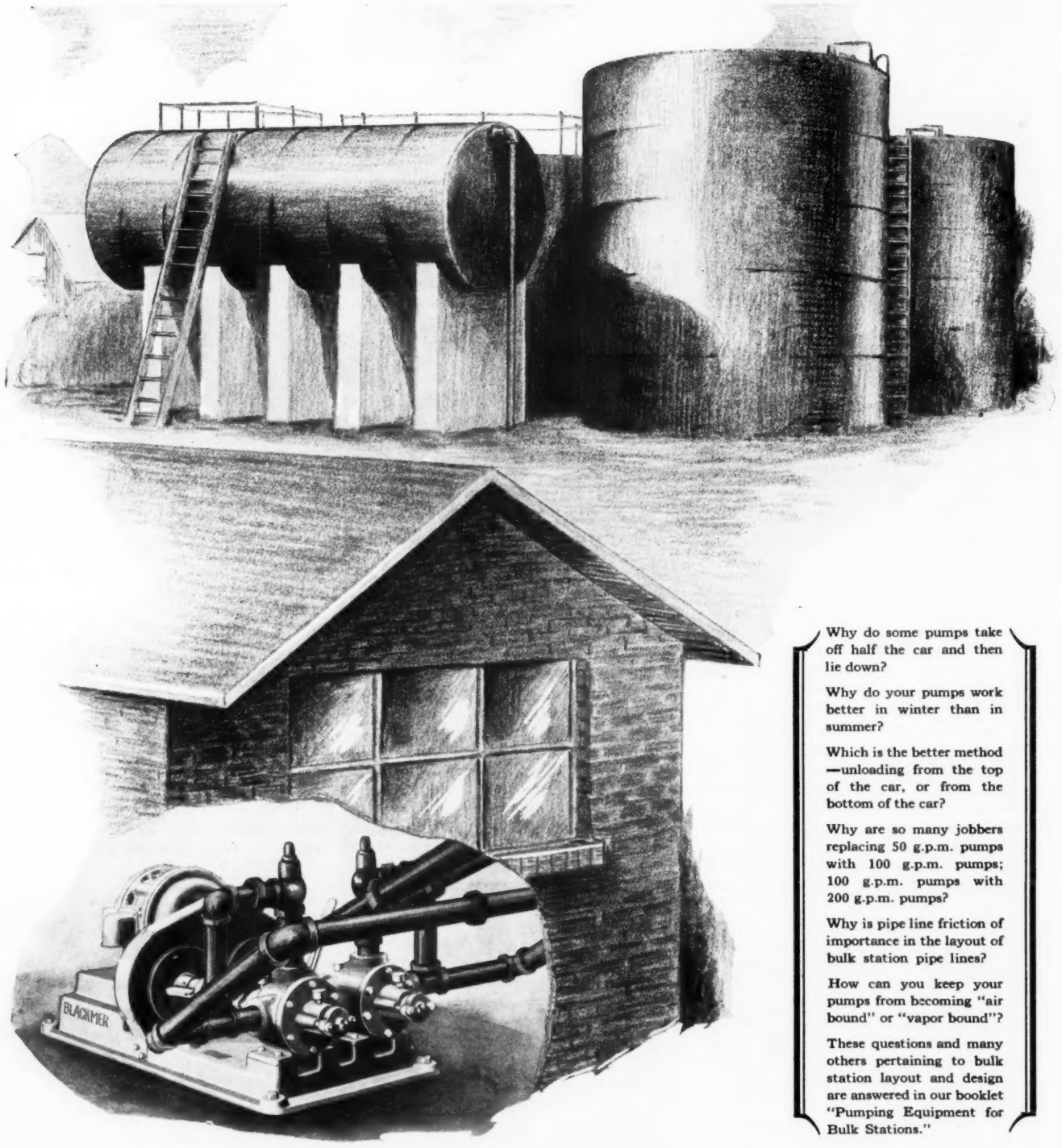

Why do some pumps take off half the car and then lie down?

Why do your pumps work better in winter than in summer?

Which is the better method —unloading from the top of the car, or from the bottom of the car?

Why are so many jobbers replacing 50 g.p.m. pumps with 100 g.p.m. pumps; 100 g.p.m. pumps with 200 g.p.m. pumps?

Why is pipe line friction of importance in the layout of bulk station pipe lines?

How can you keep your pumps from becoming "air bound" or "vapor bound"?

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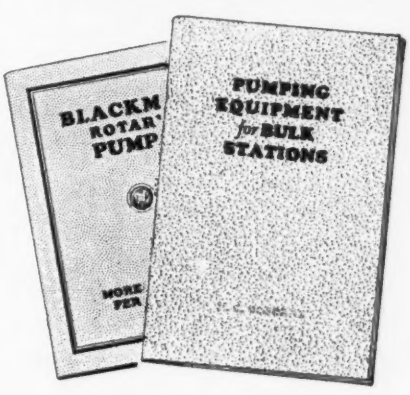

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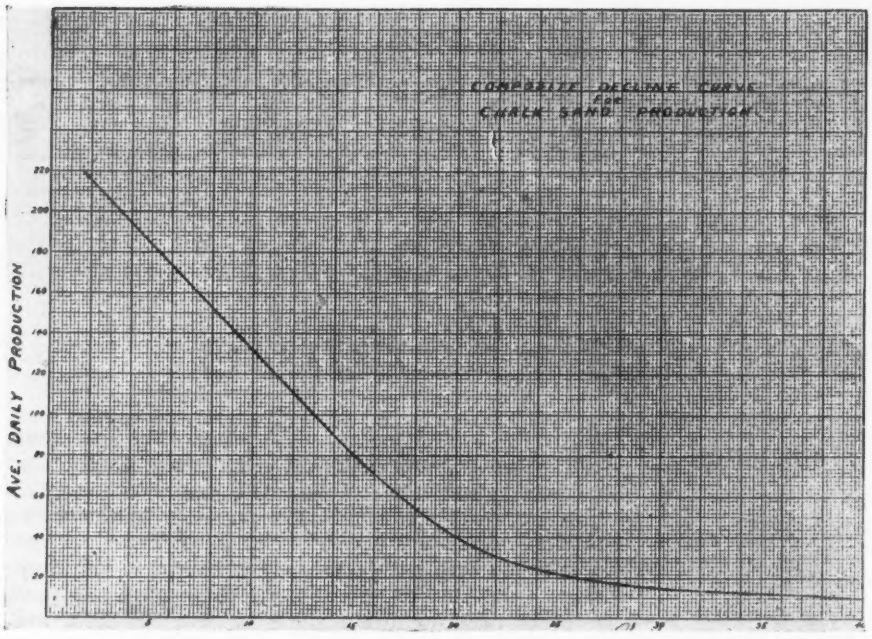


wells in the lower zone have higher initial productions and a rapid decline caused by the encroachment of water. Both zones show wide variations in porosity, which accounts for great difference in initial production.

No free gas has been encountered in either zone and the production is characterized by low gas-oil ratios. The initial fluid level in the upper zone was 1,700 feet, with occasional flowing wells in more porous areas. The lower zone is characterized by high fluid levels, due to water pressure.

Drilling Methods

Cable tools have been used entirely for drilling in the Crane-Upton field.

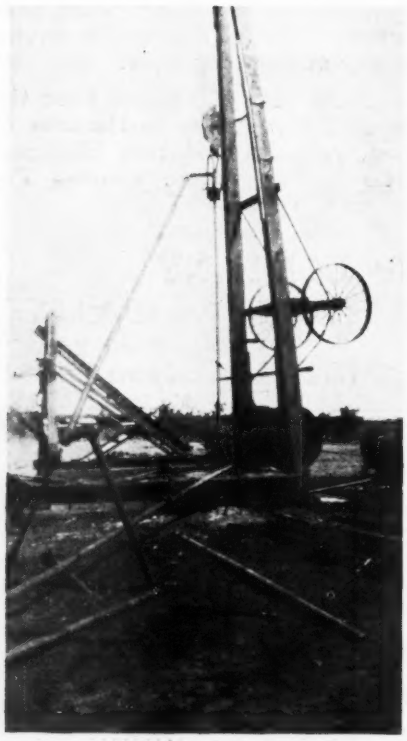


Fig. 14—Well head connections. Chalk, or Roberts, field

The standard cable tool equipment has been generally used for drilling purposes, although some wells have been drilled with machines, and the average drilling time is 30 days. Wells vary in depth from 1,900 feet to 2,500 feet. The cost of drilling varies from $20,000 to $25,000. The lack of good water is responsible for the universal use of internal combustion engines for drilling purposes. Both oil and multiple cylinder gasoline engines have been used with much success. No wells have been drilled with either steam or electricity.

Casing Program:

A 10″-40 lb., 8¼″-32 lb., 6⅝″-24 lb. casing program has been used, although in certain cases 8¼″ casing has been eliminated. It has been customary to set 10″ casing just above the top of the salt, a string of 8″ below the salt and the 6⅝″ casing in the brown Dolomite which occurs 100 feet above the top of the big lime.

This program has been varied, as mentioned above, by setting the 10″ above the top of the salt and the 6⅝″ in the brown lime, thus eliminating the 8¼″ string set through the salt formation. This latter method is entirely satisfactory in case no water is encountered from the top of the salt to the top of the brown lime.

The use of cement, in setting casing, has not been practiced, except in a few cases. This practice has been necessary on account of heavy shots used to increase the production, as the last string of casing is usually lifted as much as 500 feet before shooting.

Wells, completed in the upper zone, are drilled to a predetermined depth and given a swabbing test, then shot and thoroughly cleaned out. Wells drilled to the lower zone usually flow when the lower zone is penetrated. These wells are immediately pinched in and allowed to flow under high back pressure in order to hold back the water.

Production Methods

Multiple pumping units are generally used on the small producers, while larger wells producing water are pumped on the beam. Two inch tubing is used on the smaller wells and 2½″ and 3″ tubing used on the larger wells which produce water. The air lift has been tried and was successful on wells having high fluid levels and capable of producing large volumes of fluid. Wells of this character are wells which produce water, and care must be taken to eliminate the effect of corrosion.

The use of air lift has been discontinued in favor of the pump. The bad gas, and the corrosive character of the oil and water makes the lifting of oil very costly. Intermittent pumping is practiced on the smaller wells. However, no tests have been made to prove the advantage of this method of producing small wells. Where sufficient casing head gas is available, gas engines are used for power. If the horsepower rating of the gas engine is double that of the power requirements, very little trouble is experienced by using gas for fuel.

Treating Costs:

Treating costs average from one cent to two cents per barrel. Chemical is generally used for breaking down the emulsion, although there are several electrical dehydraters in the field which are working satisfactorily. Heat is required in conjunction with either electrical or chemical methods during the colder months. Excelsior tanks in conjunction with chemical have also proven satisfactory.

Corrosion:

The detrimental effects of corrosion are starting to show up in the Crane-Upton field. Tubing, rods and flow lines are being the most affected by corrosion. The bottoms of stock and storage tanks are also being slightly injured.

Production

The initial productions in the field range from 10 to 4,000 barrels per day. The estimated ultimate production per acre for the entire field is 3,500 barrels, based on the extensions of accumulative production curves, on the semi-logarithmic paper. Ultimate

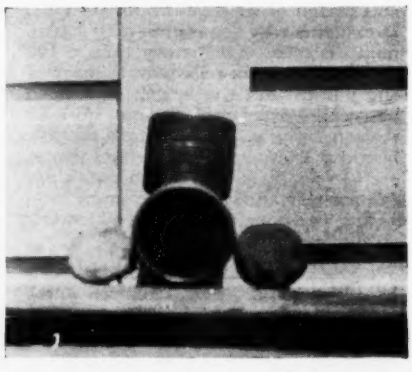


Fig. 15—Showing size of particles removed through two-inch tubing in well in Chalk pool

productions per acre should range from 300 to 20,000 barrels. Large drainage areas in certain wells account for the high recovery per acre.

Method of Increasing Production:

Shooting has been the principal method of increasing production, with shots varying from 50 to 550 quarts of liquid nitroglycerin or solidified nitroglycerin. Increases of as much as 300 per cent have been noted. Clean-out work has not been as beneficial as might be expected toward increased production. The air lift has increased production on some wells. Repressuring has been resorted to in a minor way, but has not been sufficiently applied to show any results.

Gas:

Gas-oil ratios on pumping wells average 300 cubic feet to the barrel. Very few measurements have been made on gas-oil ratios on any flowing wells in the field. The gas itself carries 5 per cent hydrogen sulfide and gasoline contents of as much as 1½ gallons per 1,000 cubic feet have been noted. The gas is used locally for fuel, but considerable care must be taken in its use for domestic purposes.

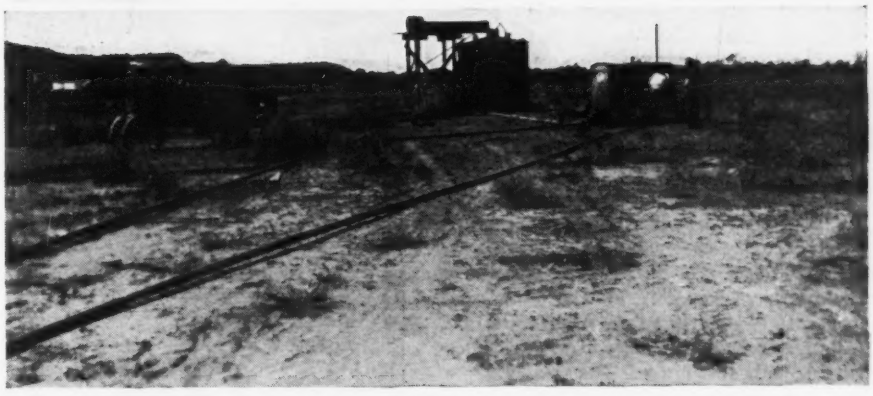


Fig. 13—Method of connecting up clean-out equipment. Chalk, or Roberts, field

Yates Field

The discovery well in the Yates field was drilled by the Mid-Kansas Oil and Gas Company in Sec. 60, Block 1, I. & G. N. Railway Survey, Pecos county and was completed on Dec. 14, 1926, at 1,004 feet, with an initial production of 350 barrels per day. This well was later deepened and showed substantial increase in production.

Development was slow in getting started, but with the completion of a few large wells development increased until the necessity of prorating the field was realized. After the prorate went into effect on Oct. 1, 1927, drilling operations still continued; however, when the method of prorate was placed on a productive acreage basis, drilling was confined to increasing the known productive acreage of each operator in the field.

On Oct. 1, 1927, hourly gauges gave the field a production of 172,845 barrels per day. The known productive acreage at the present time is approximately 12,000 acres.

Sub-Surface Data

The structure is anticlinal, and is composed of two domes, separated by a low saddle, across which production extends. Surface elevations in the field vary from 2,150 feet to 2,960 feet. The drilling starts in lime at the highest part topographically. Fresh water is encountered at depths ranging from 50 feet to 432 feet.

A second water zone is located about 100 feet below the upper water zone and is separated from it by blue shale and lime. The third water zone is located about 160 feet below the second water and is separated from it by blue shale and lime.

The fourth water zone is located about 260 feet below the third water zone and is separated from it by lime and Anhydrite with some red shale. This fourth water zone is about 10 feet in thickness and carries sulfur water, which sometimes carries a show of oil.

The formation below the fourth water zone and the top of the brown lime is chiefly Anhydrite with some red beds and sand. On the flanks of the structure the percentage of sand and Anhydrite is greater than on top of the structure. The top of the brown lime consists of brown Dolomitic lime, underlain by about 30 feet of sand, sandy shale and Anhydrite. At the base of this sandy zone is the gray lime series in which the oil and gas occur.

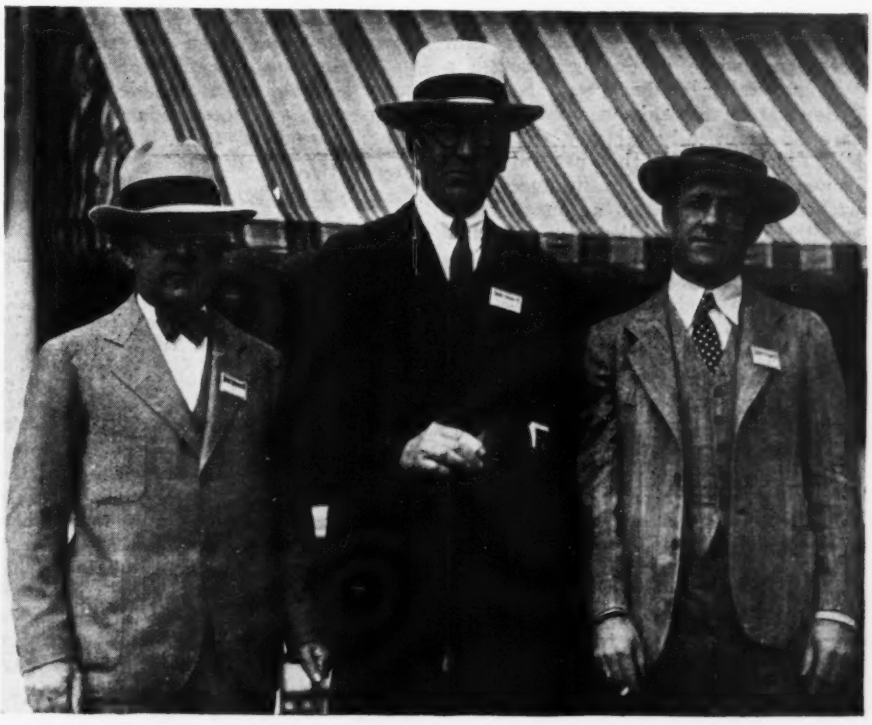
Oil has been encountered above the top of the lime in a few instances—the lime has been penetrated as much as 230 feet for production. Differences in porosity have been responsible for wide differences in initial productions even in the case of off-set wells.

Drilling Methods

The cable tool method of drilling has been universally used in the development of the Yates Pool. Two attempts to drill with rotary have been made on wells located near the Pecos river bed, but some difficulty has been encountered in completing the wells. A substantial saving in casing would be made with the rotary method of drilling. Standard rigs and drilling machines, as well as spudders, have been used in drilling wells to completion. Steam is generally used for drilling purposes, although some oil and gasoline engines have been used.

Costs:

Drilling depths range from 915 feet to 1,725 feet. Most of the drilling



Frank J. Hinderliter, Hinderliter Tool Co., Tulsa; D. D. Wertzberger, Wertzberger Derrick Co., Tulsa and J. Burr Gibbons, general manager International Petroleum Exposition

is being done by contract, with prices ranging from $3.50 to $5.50 per foot. Drilling costs range from $7,500 to $18,000. Road building has increased the cost of a number of wells on account of the wide ranges in topography.

Casing programs consist of either a 12½"-50 lb., 10"-40 lb., 8¼"-32 lb., or a 10"-40 lb., 8¼"-32 lb. and 6⅝"-24 lb. The last string of casing is usually set on top of the lime or just above the top of the lime and cemented by the two plug method. Chemical is generally used to accelerate the setting of the cement.

Method of Completing Wells:

Well head connections consist of a master gate with a cross above it, then a second gate and a control head. Other wells are connected with only a master gate and control head. Wells connected in this manner are either produced through the connections used in drilling in, or the control head is removed and more suitable connections are installed.

Hourly gauges are often taken while drilling in, in order to determine the depth at which the greatest increase occurs.

The wells are usually drilled to a predetermined depth, dependent upon its location on structure and the amount of oil the well is capable of producing. It is important that each well be drilled to the same producing zone as its offset well. Porosity in the lime has produced small porosity structures which are more important for correlation purposes than the top of the lime, or penetrations in the lime.

Production Methods

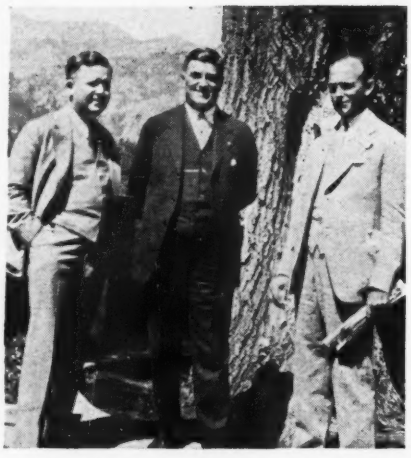
All wells drilled in the field have come in as flowing wells. Flow pressures as high as 550 pounds have been noted. Closed-in pressures on some wells are the same as flow pressures, while producing through a ½" or smaller choke.

Separators have been used to take care of practically all of the production, although at the present time it would be possible to produce wells without separators, on account of the small production allowed, and low gas-oil ratios.

All wells are allowed to flow through the casing. Flow lines vary in size from 2" to 6⅝" and are often arranged so that the cross-sectional area of the flow lines will be as large as the cross-sectional area of the oil string.

During the prorate, some operators have pinched their wells with either a gate or a flow nipple, allowing them the flow continuously for 24 hours. When correctly regulated, the amount of oil produced is practically constant from day to day. Other operators open their wells for a few hours each day, allowing them to produce the quota of production.

Recording pressure gauges are used to some extent to record the flow or closed-in pressure. Wider use of these gauges, and the study of the periods of flow of offset wells, could be used as a method of correlation. Some interesting data has already been obtained through their use.



Everett DeGolyer, president, Amerada Petroleum Corp., Ernest J. Nicklos, general superintendent, Mid-Continent district for The Texas Co.; and Adrian Moore, Rycade Oil Corp., Houston. Mr. Nicklos is national chairman of the A. P. I. standardization committee on rotary drilling equipment. Mr. Moore is vice chairman of the Texas-La.-Ark. district of the new production engineering division.

The use of the tubing on one small well steadied the flow, but did not materially increase production. Bottom hole pressures are sufficiently high to cause most wells to continue flowing, even though producing 100 per cent water. Rapid encroachment of water in certain edge wells can be controlled by producing them under high back pressure. One edge well, which was producing 50 per cent water, produced clean oil after being shut in for 30 days.

When water first appears, an increase in back pressure decreases the percentage of water, but after the percentage of water has reached 20 to 30 per cent the effect of back pressure is not so noticeable and may even cause an increase in water for a short period of time.

Power Used:

Electric power is now available in the field from two power companies, with a rate of about 1.8 cents per K. W. H. Some motor driven centrifugal oil pumps are in use in the field. Electricity is gradually displacing steam, oil and gas engines for power purposes.

Testing Costs:

Chemical introduced through lubricators placed on the flow lines readily breaks down the emulsion without the use of heat.

Treating costs by the chemical method range from 1 to 2½ cents per barrel. Electrical dehydrators have been tried in the field, but as yet have not proven entirely satisfactory.

Corrosion will undoubtedly be a source of considerable trouble in the Yates field, due to the character of the oil, gas and water produced.

Production

Initial productions range from 25 barrels per day to 100,000 barrels per day. These figures for initial production on the larger wells are based on hourly gauges. The average initial production per well for the field, based on hourly gauges, is 10,000 barrels. The total accumulative production for the field up to April 1 was 9,716,184 barrels. One operator in the field has produced slightly less than half the total production. On account of the method of production, very little data on declines are available. It has been estimated that the ultimate recovery per acre will range from 40,000 to 50,000 barrels.

Methods of Increasing Production:

Shooting has been used in few cases to increase production on very small wells. At the present time methods of increasing production are not used on account of the proration. The air gas lift could be used to an advantage on some wells in the field. Repressuring appears to be impractical. The natural water drive, which is now in progress, under ideal conditions should lead to a high recovery of oil.

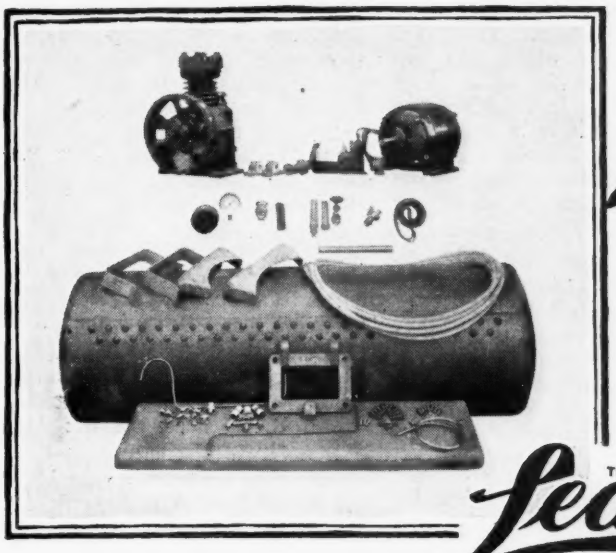
Gas:

Free gas is rarely encountered above the oil zone. The gas-oil ratio averages about 350 cubic feet per barrel. Fig. 6 shows the relationship between well head pressure, well production, gas-oil ratio, gasoline content and size choke. The gas-oil ratio curve on this chart shows the size of choke, which gives a maximum gas-oil ratio. This same characteristic was shown by other wells. Gasoline content ranges from 0.25 to 1.75 gallons per 1,000 cubic feet of the gas.

Hendricks Field

The discovery well in the Hendricks field was drilled in November, 1926, by the Westbrook interests in the southeast quarter of Sec. 45, Block 5, Public School Land, Winkler county. This well was completed at a depth of 3032 feet, with an initial production of 420 barrels. Very little interest was shown in this discovery on account of the depths at which the oil was encountered, lack of transportation facilities, and the relatively low initial production.

However, the completion of the Gulf Production Co.'s diagonal offset as a 5000-barrel producer stimulated interest in the area. Development has been rapid in the last six months and has extended the field to the east and north. On June 1, 1928, the field appears to have a proven area of 5,000 acres, extending for a distance of 6 miles north and south, and three miles east and west. The daily



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production has been as high as 322,000 barrels.

The rapid development of the field and high initial production of the individual wells have made the Hendricks field the most important in West Texas.

Sub-Surface Data

Production comes from the big lime, but differs somewhat from the Yates, McCamey and Gulf McElroy fields in that oil is usually encountered below the 300 feet level in the big lime.

Complete information as to the character and contents of the formation above the big lime is not available, as most of the wells have been drilled with rotary from the surface to the top of the big lime. However, the log shown below gives an idea of the formations and their contents:

0— 350 Sand, water sand and red shale.
350— 550 Red Rock.
550— 650 Sand, water sand and shale.
650—1050 Red sand and shale.
1050—1300 Anhydrite, water mud, blue shale.
1300—1800 Salt and Anhydrite.
1800—2300 Anhydrite, shale, streaks of lime.
2300—3000 Lime, gas and oil.

Sub-surface contour maps using the top of the big lime as a marker, reveal an anticlinal structure with a steep west and south dip and a flat area on top of the structure. The limits of the field have not been defined to the north and east, but there is evidence to show that the dip in those directions will be more gentle.

Water has been encountered in four separate sands above the top of the salt; the water encountered in a sand varying from 125 feet to 300 feet from the surface is used for domestic and development purpose. Water has also been encountered in the lime in wells drilled off the structure.

Oil and Gas Horizons:

Four separate oil horizons have been recognized in the lime, with the first horizon at 300 feet, second horizon at 400 feet, third horizon at 500 feet and the fourth horizon at 600 feet. These depths in the lime may vary as much as 25 feet either way. The 300 feet and 600 feet horizons have proven the most prolific.

Water encroachment has been more troublesome on the lower horizons. All of these horizons may not be productive in all wells, and may be entirely absent or carry gas. Changes in porosity in the lime are responsible for the radical differences in the production of each well. Closure within a porous stratum in the lime has been responsible for a natural separation of the gas and oil within this porous zone. Certain wells will blow dry gas for a period of time and then gradually produce oil, showing that the well is near the gas-oil contact of this small structure formed by changes in porosity.

Gas usually occurs at different intervals from the top of the lime down to the 300 feet horizon. There are several instances in which gas has been found above the top of the lime and has caused very troublesome and expensive blowouts. Gas is sometimes found in the usual oil producing horizons in wells structurally high, or on minor porosity highs in these oil zones.

Pressures:

The closed in pressure of gas wells averages 1,350 pounds. The uniformity of pressures throughout the field is indicative of a pressure connection between the gas and oil zones. The connection between the oil and gas zones may be so minute that the gas will pass through leaving the oil behind.

Drilling Methods

(See Figs. 8, 9 and 10.)

The discovery well was drilled to completion with cable tools. Present practice is to drill the wells to completion with rotary or drill to the top of the lime with rotary and complete the wells with cable tools.

In the big gas area, wells drilled to completion with the rotary have been more successful. A mud with good wall forming properties should be used in drilling through the salt measures. Rock bits are generally used after first string of casing is set.

The average drilling time with rotary is 55 days, as compared to 70 days by the combination method.

Drilling costs range from $45,000 to $65,000, with depth ranging from 2,725 to 3,050 feet.

It is believed that the rotary method of completing wells is just as successful as the cable tool method, and entails considerable saving of time and money. It also prevents excessive loss of gas.

Casing Program:

The most accepted and widely used casing program at present is to set 12½"-50 pound casing in sand stone at depth ranging from 150 feet to 700 feet and cement to the surface, using accelerator in the last 200 sacks of cement. A second string, which is usually 8¼"-36 pound seamless casing is set in hard Anhydrite or lime at depths ranging from 2,300 feet to 2,650 feet and cemented to the shoe of the first string.

In special cases 6⅝" casing is set above the main producing horizon. The 8¼" casing is usually tested by drilling out a few feet below the shoe and bailing the hole dry. There has been no trouble with cement not setting, except where there was known to be gas agitation.

Rotary Method of Completion:

In the case of wells drilled to completion with the rotary, all well head connections are installed as soon as possible after the 8¼" casing is cemented. Casings are connected at the surface with a Regan head. Directly above the Regan head is a 3,000 pound to 4,000 pound master gate, then an 8¼" cross with either 4", 6" or 8" outlets. In some cases the blowout preventor is placed directly above the cross with a drilling gate above the blowout preventor. In other cases the blowout preventor is on top. However, the drilling gate placed above the blowout preventor insures better protection in case the well should come in while drilling.

Coring to locate the oil measures is being more generally adopted. The Hughes type hard formation core barrel gives good service and drills more hole per set of cutters than the rock bit does per set of cones.

A mixture of baroid and mud is usually used for drilling fluid while drilling in the lime. A drilling fluid with a gravity of 1.3 gives ample protection against blowouts. Weighing cans are often used in determining the weight of the mud. After the well has been drilled to its total depth, the blowout preventor is usually removed and the fluid bailed down and the well allowed to come in. After the well is allowed to flow open from one-half to one hour, in order to clean itself, it is then turned into the flow lines. All common methods of pinching the wells in have been used, although the Venturi type of flow beans is becoming more popular.

Cable Tool Method of Completion:

Cable tool completions are less common than during the earlier life of the field. The well head connections are practically the same as for rotary with the exception of the blowout preventor and the use of a control head and ordinary oilsaver or the high pressure oilsaver.

The Craig oilsaver and the Fields High pressure oilsavers have both been subjected to 1,000 pounds to 1200 pounds pressure and operate satisfactorily. A large number of wells have been completed without the high pressure oilsaver. It is usually necessary to snub the tools in and out of the hole.

Heavy gas flows have prevented the completion to the oil zone of several wells drilled with cable tools. Outlets from the cross, used between gates on the oil string, must be larger than on rotary drilled holes, in order to decrease the flow pressure.

Production Methods

Most of the wells are completed as flowing wells and are allowed to flow through the oil string, which is either 6⅝" or 8¼" or A. P. I. 9". A few edge wells are on the pump.

Individual pumping units have been installed at a number of flowing wells so that this equipment will be ready when the well stops flowing or production drops to a point where it will be economical to place the well on

the pump. Electricity will be used to operate the pumping units.

The gas lift has been used on four wells in the field with good results, except that it cuts the oil in wells producing water. It is believed that the sub-surface conditions are such that the gas lift will prove the most economical method of production. At the present time the use of the gas lift will not be permitted by the Railroad Commission.

All flowing wells are equipped with separators. The riveted type separators are the most popular on account of higher operating pressure. Flow lines are often laid so that the separator may be bypassed and the oil and gas diverted directly to the stock tanks. Excess gas escaping from the separator risers is often burned as a fire and health measure.

Power Used:

Steam is most generally used for power on account of the abundant supply of gas and water. Electric power is also available in the field, with a rate of about 1.8 cents per K. W. H.

Oil Treating Methods:

The encroachment of water makes an economical treating plant of utmost importance. The electrical and chemical methods of breaking down the emulsion are being used. In some wells it has been necessary to use both methods in order to clean the oil. This condition appears to be only temporary and with a decrease in gas agitation, the emulsion is more easily broken down. Heat is usually used in conjunction with either the electrical or chemical method. Chemical lubricators placed between the choke and the well give the best results, and in any case should be placed as close to the well as possible. Treating costs vary from 0.5 to 5 cents per barrel.

Corrosion is less detrimental in the Hendricks field than in other West Texas fields.

Production

Initial productions in the field vary from 300 to 85,000 barrels per day. The gas wells have gauged as much as 70,000,000 cubic feet per day.

In a broad way, initial production of both oil and gas are related to the structure, although porosity is the controlling factor.

There is not sufficient production data in the field to be able to place a very reliable estimate on recovery, although it appears from information at hand that the ultimate recovery per acre will be from 20,000 to 30,000 barrels. Some leases in the field have already produced over 30,000 barrels to the acre.

The encroachment of water does not affect the production as rapidly as would be expected. If properly controlled, the water encroachment will lead to increased recovery.

Methods of Increasing Production:

In the Hendricks field shooting has been used to increase production on the very small wells. This was a case of increasing the production or abandoning them. All the wells so far shot have responded satisfactorily, showing an increase of 50 to 500 per cent over the production before the shot.

An increase in production was shown with the gas lift. The use of tubing in wells producing water has increased the production.

Re-arrangement of flow lines and separators to decrease back pressure on wells producing water has been beneficial. Some wells have doubled in production when separators were placed in derrick.

The Hendricks field is characterized by a large amount of available gas.

The natural gas-oil ratio from dissolved gas alone, averages 400 cubic feet per barrel. In the case of wells having upper gas, which is being produced with the oil, the producing gas-oil ratio may run 30,000 cubic feet per barrel.

The volume of oil which the well is capable of producing controls the producing gas-oil ratio in wells which have upper gas.

While one well was producing 50,000,000 cubic feet of dry gas, it started to produce oil and caused the volume to drop to 11,000,000 cubic feet showing a gas-oil ratio of 990. A number of other wells in the field have shown this same characteristic.

The gasoline content of the gas produced with the oil ranges from .25 to 1.25 gallons per 1000 cubic feet.

Chalk or Roberts Field

The Chalk or Roberts field was discovered in the fall of 1925. However, little progress was shown until the spring of 1927, when a drilling campaign developed enough of the field to give some idea of its probable trend and extent. This rapid development stopped when the drop in the price of oil came, and since that time, drilling has been confined to locating the extent of the field, and exploring the lime section. The Roberts or 2,900 feet lime horizon was discovered in the fall of 1927, and a number of wells have since been drilled to this horizon.

At the present time it appears that the productive acreage will be at least 7,500 acres.

Sub-Surface Data

The Chalk or Roberts field, in Howard county, has five producing horizons, one of which is of minor commercial importance.

The first or Settles sand is encountered at depths ranging from 1,200 feet to 1,300 feet and varies from 20 feet to 40 feet in thickness. The Fred Heyer sand is encountered 150 feet below the Settles sand and varies in thickness from 10 feet to 30 feet, and contains either oil or gas, or is dry.

About 250 feet below the Heyer sand is the Chalk sand, which at the present time is the chief producing horizon in the old Chalk field area. This is a fine sand, which varies in thickness from 11 to 20 feet, and shows considerable variation in the amount of cementing material.

About 750 feet below the Chalk sand and in the Big Lime is the so-called 2,500-foot lime horizon, which was first discovered in Marland Clay E-1. This particular horizon is, at the present time, being exploited and, to date, the thickness has been found to be from 10 feet to 40 feet. This is typical lime production and shows the characteristic variation in porosity typical of other West Texas lime fields.

About 400 feet below the 2,500-foot horizon is the Dora Roberts horizon. This horizon is now being exploited and the thickness has been found to be as much as 30 feet. It is characterized by flowing wells, with an initial production of about 3,000 barrels. The location of the Dora Roberts horizon is more uniform than the so-called 2,500 foot horizon.

The oil from the Settles sand is about 29 gravity and contains .75 per cent sulfur. Very little gas accompanies the oil, and water is encountered down the flanks of the structure.

The oil from the Heyer sand is about 30 gravity and contains less sulfur. The oil produced from this horizon is of no commercial importance.

The gravity of the oil produced from the Chalk sand varies from 29 degrees to 33 degrees A. P. I. In the higher part of the structure, free gas is encountered, with oil down the flanks, and salt water still lower on the structure. This oil contains .90 per cent sulfur.

The oil produced from the 2,500-foot pay and the Dora Roberts pay varies from 27 to 30 gravity. This oil contains from 2 to 2.3 per cent sulfur. Very little gas accompanies the oil from either of these horizons.

In some areas, only one horizon is productive; while in others, as much as three horizons are productive.

These variations in productive areas of the different producing formations is due to the presence of several minor highs on a large major fold, extending through the field for a distance of 10 miles.

Drilling Methods

There is no uniform method of drilling or completing wells in the Chalk field. Rotary and cable tools have been used in drilling wells to completion to the Chalk sand and to the Roberts lime production. One of the large operators in the field drills all wells to the Chalk sand with drilling machine, and drills to the Roberts pay with standard cable tools. One operator drills all Chalk sand wells to within 20 feet of the top of the sand with the rotary,

where he cements the casing and then completes the well with a drilling machine.

The rotary has been used in completing several wells in the Chalk sand. Drilling machines have been used to drill to the 1200 feet or Settles sand. Wells drilled to the Chalk sand are completed and ready for the pump in 30 days when drilled by the combination rotary and cable tool method, while at least 55 days are required to complete a well with cable tools only. This includes shooting and cleaning out after the shot.

All wells, with the exception of two, have been drilled to the Dora Roberts pay with cable tools. It requires 75 days to drill with cable tools and 55 days to drill with rotary.

There is a considerable saving in casing and drilling lines when the rotary is used to drill to the Roberts horizon. The oil from the 2,500-foot horizon is very destructive to drilling lines and is not easily cased off.

Drilling Costs:

The cost of drilling to the Settles sand varies from $7,000 to $9,000.

Wells drilled to the Chalk sand by the combination rotary-cable tool method cost from $10,000 to $12,000, equipped to pump. The cost of drilling with cable tools ranges from $15,000 to $18,000.

The higher drilling cost for cable tools is due to the extra amount of casing needed.

The cost of drilling to the Roberts horizon varies from $30,000 to $40,000.

Casing Program:

In drilling wells to the Chalk sand with cable tools a 12½"-50 lb., 10"-40 lb., 8¼"-32 lb. and 6⅝"-26 lb. casing program is used. These different strings are not set at any uniform stratigraphic level, although it is usually necessary to set a string of casing below each water sand, as water causes the red bed formation to cave. The last string of casing is set from 50 feet to as much as 300 feet above the top of the Chalk sand which, in some cases, allows the Heyer and Chalk sands to be produced together. In some wells it is possible to set the 8¼" casing where the 6⅝" casing is usually set. When the last string of casing is set, it is sometimes possible to pull either the 10" or 12½" casing. Cement is rarely used in setting casing in cable tool holes.

In drilling with the rotary, a few joints of 12½" or 10" are set and cemented at the surface. A second string, which is usually 6⅝", is set at depths varying from 20 feet to 250 feet above the Chalk sand. However, all operators are setting casing much closer to the top of the sand than heretofore.

It is general practice to cement the last string of casing set in rotary drilled wells with 65 sacks of cement. This is sufficient to cover the Heyer sand and the Settles or 1,200 foot sand when 6⅝" casing is cemented in a 9" hole just above the top of the Chalk sand. No difficulty has been encountered in running pipe to bottom in rotary drilled holes.

In drilling wells to the Dora Roberts pay it is customary to cement the 6⅝" casing below a 50 foot water-bearing stratum which is found 100 feet above the producing horizon. Sufficient cement is used to cover the 2,500 foot pay.

In drilling with cable tools to the Dora Roberts pay, 15½" casing is set below the surface water and each additional string is carried as far as possible, so that the 2,500-foot lime horizon and a water sand, which is encountered just above the Roberts horizon, may be cased off with the 6⅝" casing. Sufficient cement is used to protect the oil and water stratum.

Cementing:

The two plug method of cement is generally used in all cementing operations, although the dump bailer method is used in special cases. Gasoline and steam driven cementing outfits are available. Chemical is usually used with the entire mix of cement.

It is general practice to let the cement set 4 days before testing the casing. A test for water shut-off is made after drilling out the plug. There has been little difficulty in securing a water shut-off where casing is cemented.

Methods of Completing Wells:

Wells drilled to the Chalk sand are, in general, completed with cable tools. The penetration into the sand is determined by the position of the well on the structure. In the case of wells high on the structure, a 3 foot to 5 foot pocket is often drilled below the sand, while wells low structurally and near the edge water line are drilled 8 to 12 feet in the sand. However, some operators drill through the sand regardless of structural position, and as a result, start treating the oil soon after completion of the well.

A few Chalk sand wells flow, but in general the fluid level rises from 800 feet to 1,500 feet in the hole, depending upon the structural, sand and pressure conditions. After the sand has been drilled and it has been decided to shoot, the well is swabbed for a test, then shot and cleaned out.

All wells completed in the Roberts horizon flow naturally or by agitation. At the present, all the Roberts production is shut in.

Production Methods

All wells which do not flow are either swabbed or placed on the pump. However, swabbing is not used as a permanent method of production.

The Chalk sand wells are the most difficult to keep pumping. The fine sand, which is produced with the oil, cuts the cups, causing a large number of pulling jobs. This difficulty has been partially overcome by frequent clean-out operations; the use of plunger pumps, and the maintenance of a high pumping fluid level.

The band wheel power is used to pump most Chalk sand wells, although a few of the newer individual pumping units are in use. The character of the topography, in certain sections of the field, makes the individual pumping unit almost a necessity.

Gas engines and electric motors are used to drive the powers and individual pumping units. There is sufficient gas throughout the field for fuel. Electric power is available at 1.7 cents per K. W. H.

Treating Costs:

Treating costs vary from ¼ to 2 cents per barrel. Chemicals and heat are the only methods used to break down the emulsion. The chemical is introduced into the lead line through force feed pumps, operated by the pump jacks.

During the summer months, it is not necessary to use chemicals. The Chalk sand oil contains considerable paraffin, which settles out during cold weather and helps to hold the water particles in suspension. One operator has installed thermosyphon heaters which entirely eliminate the use of chemicals.

The oil from the 2,500 foot and Roberts horizon is known to have corrosive properties.

Production

(See Fig. 12)

Initial Production:

Initial production from the Seattle or 1,200 foot sand ranges from 30 to 650 barrels per day.

Wells in the Heyer sand have averaged 9 barrels per day.

Chalk sand wells have an initial production ranging from 50 to 225 barrels per day.

The initial production of wells in the 2,500 horizon range from 20 to 2,400 barrels per day. The Roberts horizon has yielded wells ranging from 20 to 4,200 barrels per day, with an average initial of 2,800 barrels.

Ultimate Production:

Production records over a period of two years are available on the Chalk sand production. Ultimate production per acre should range from 3,000 to 20,000 barrels. The higher figure is an exceptional case and applied to certain isolated wells having the advantage of a large drainage area. The lower figure is characteristic of a drilled up area in which the thickness of the sand was 11 feet.

Production records from the other producing horizons are so meager that it is impossible to make any estimate of ultimate production.

The results of close spacing, the advantage of rapid completion, effect of new wells on the production of offset wells, the effect of initial pressure on production, and the effect of back pressure and reduction of gas

(*Continued on Page* 64)

Spears Is President W. Va. Jobbers

CHARLESTON, W. Va., June 19.—R. E. Spears, Spears & Riddle Co., Wheeling, W. Va., was elected president of the West Virginia Oil Marketers Association at the annual meeting here June 14 and 15, succeeding W. Walter McKee, Elk Refining Co., Charleston. Attendance at this meeting is said to have broken all records for the association.

R. E. Hare, Tri-State Refining Co., Kenova, was made vice-president and D. E. Frierson, Frierson Equipment Co., Charleston, became secretary-treasurer for the fifth consecutive term. The latter office was filled by appointment after the election of the directorate. The new board of directors is composed as follows:

W. A. Jackley, South Penn Oil Co., Charleston; C. A. Street, Viking Gasoline Corp., Charleston; F. G. Bish, Appaline Oil Co., Clarksburg; W. C. Fox, Arrow Head Gasoline & Oil Co., Moundsville; H. G. Triplett, Sterling Oil Co., St. Mary's; John W. Wright, Elk Refining Co., Huntington; I. C. Jessie, Tri-State Refining Co., Logan; R. T. Elkins, Oil Service Co., Beckley; R. D. Lowe, Elk Refining Co., Charleston, and Stanley Burton, Guyan Oil & Gas Co., Logan.

The code of marketing ethics offered for adoption by the gathering was not considered by the entire assembly except to place the matter in the hands of the new directors. The directors will work out a code to be presented to the membership in the near future. The principal speakers on the program follow:

John Mather, manager of the domestic distribution department of the United States Chamber of Commerce, discussed "Present Day Trends in Distribution."

H. C. Mougey, chief chemist of the General Motors Research Corp., Detroit, told about the "Lubrication of Automobiles."

R. E. Hare, general superintendent of stations for Tri-State Refining Co., Kenova, talked on the "Futility of Price Wars."

Frank W. Lovejoy, sales manager, Vacuum Oil Co., New York, directed the attention of the gathering to the "Filling Station of the Future."

The program closed with a short talk by James A. Gilmore, secretary of the American Oil Men's Association, Chicago.

The pleasure features of the meeting consisted of a tour of inspection through the refineries of the Elk Refining Co. at Falling Rock and of the Pure Oil Co. at Cabin Creek. No action was taken on the proposition of collective advertising to the tourist trade.

GEORGE L. RATCLIFFE

Re-elected president of the California Natural Gasoline Association

Ratcliffe Heads Calif. Gasoline Men

LOS ANGELES, June 16.—George L. Ratcliffe, president, and H. L. Eggleston, vice-president, were re-elected at the annual meeting of the California Natural Gasoline Association in Los Angeles June 14. Mr. Ratcliffe is in charge of the natural gasoline department of the General Petroleum Corp., and Mr. Eggleston occupies a similar position with the Pan American Petroleum Co.

The association has 21 directors and at this meeting, 10 were elected or re-elected to serve two years. The 10 directors are, the first seven being re-elected and remaining three being new: O. C. Field, O. C. Field Gasoline Corp.; R. W. Garman, Union Oil Co.; E. R. Pratt, Honolulu Consolidated Oil Co.; F. N. Rumbley, Lovell Gasoline Corp.; Ben A. Koehler, George F. Getty, Inc.; J. F. Vordermark, Torrance Gasoline & Refining Co.; J. L. Denny, California Eastern Oil Co.; R. H. Green, Signal Gasoline Co., Inc.; L. V. Cassoday, Lomita Gasoline Co., and C. E. Beesemyer, Gilmore Gasoline Co.

In the votes cast for officers, one of the membership expressed a preference for Herbert Hoover to serve as president of the association with Al Smith to serve as vice-president. As these two gentlemen are not members of the association, the vote was disregarded.

President Ratcliffe in accepting his re-election, briefly reviewed the growth of the association during the last year, calling especial attention to the more than 100 per cent increase in membership. He promised that programs would be improved upon, if possible, and that the program committee likely would arrange for one important paper only to be read and discussed at each meeting rather than three papers as in the past.

Paul D. Barton, secretary-treasurer, read his annual financial report showing a cash balance on hand of about $1200.

The rest of the annual meeting was given over to summarized reports on the annual meeting of the Natural Gasoline Association of America in Tulsa, by those who attended from California.

Markey Wins A.P.I Golf Match

Staff Special—By Telegraph

COLORADO SPRINGS, June 18.—The grand prize, a handsome silver service offered by President E. W. Clark of the American Petroleum Institute for the lowest net score in the semi-annual golf tournament at Colorado Springs, was won by Charles E. Markey, of the Link Belt Co., Indianapolis, June 16. Mr. Markey turned in a net of 73, his handicap being 19.

The tournament was played in four flights and in each flight four prizes were awarded. The winners in each were:

First flight, Carl A. Young, director of standardization of the institute; W. C. Taylor, Standard Oil Co. of Louisiana; W. S. Evans, Lucey Products Corp., and Z. F. Harshton, Imperial Belting Co.

Second flight, W. S. Nicoll, Midwest Exploration Co.; A. E. Butts, A. O. Smith Corp.; R. A. Wilson, The Guiberson Corp., and Adrian Moore, Rycade Oil Corp.

Third flight, Frank O. Prior, Dixie Oil Co.; W. A. Trout, Emsco Derrick and Equipment Co.; H. C. Bretschneider, Midwest Exploration Co., and W. H. V. Thompson, Oil Well Supply Co.

Fourth flight, W. W. Scott, Humble Oil & Refining Co.; D. R. Knowlton, Phillips Petroleum Co.; C. R. Weiss, Link Belt Co., and N. G. Bruce, Rubber Association of America.

In the driving contest C. R. Barton of Spang-Chalfant Co., won first prize with G. B. Jenkinson, Midwest Refining Co., second.

Harry L. Deming Joins Pierce Petroleum

ST. LOUIS, June 15.—Harry L. Deming, general manager of Lincoln Oil Refining Co., Robinson, Ill., since 1923, became identified with Pierce Petroleum Corp., June 15 as assistant to President E. D. Levy.

Mr. Levy has announced Mr. Deming's engagement by his company in a general letter to customers and friends of Pierce Petroleum. Mr. Deming left Lincoln Oil Refining Co. about three months ago.

Compilation Of Mid-Continent Refinery Operations

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National Petroleum News

Mid-Continent Refinery Operations Week Ended June 15 (By Telegraph)

	Kansas	Oklahoma	North & Cent. Texas	North La.-Ark.	Total Week Ended June 15	Total Week Ended May 18
Plants Reporting	12	28	28	12	80	80
Crude Capacity (bbls.)	92,000	157,200	127,600	54,900	431,700	416,600
Cracking Capacity	30,700	52,600	17,200	22,700	123,200	122,200
Da. Av. Crude Runs	66,229 — 3.6	117,292 — 1.1	78,261 — 5.1	58,241 + 1.9	320,023 — 2.0	326,395
Da. Av. Other Oils	6,439 + 1.7	6,221 — 12.6	6,628 — 22.7	38 — 87.7	19,326 — 13.4	14,318
GASOLINE—Gallons						
Stocks, June 8	14,842,000	43,386,000	15,707,000	4,122,000	78,057,000	92,591,000
Prod. 6-8 to 6-15	9,591,000 — 3.3	20,360,000 + 9.7	8,866,000 — 8.1	5,182,000 — 2.7	43,999,000 + 1.2	42,955,000
Ship. 6-8 to 6-15	8,873,000 — 4.3	19,434,000 — 1.6	8,624,000 — 10.9	4,991,000 — 7.4	41,922,000 — 4.9	48,674,000
Stocks, June 15	15,560,000 + 4.8	44,312,000 + 2.1	15,949,000 + 1.0	4,313,000 + 4.6	80,134,000 + 2.7	86,872,000
Ratio Sales to Prod	92.5%	95.5%	97.3%	96.3%	95.3%	113.3%
KEROSENE—Gallons						
Stocks, June 8	5,359,000	4,675,000	1,372,000	931,000	12,337,000	9,772,000
Prod. 6-8 to 6-15	1,951,000 — 4.1	2,440,000 + 2.3	1,441,000 + 13.5	633,000 + 6.8	6,465,000 + 6.6	6,886,000
Ship. 6-8 to 6-15	1,357,000 — 10.5	1,997,000 —19.0	1,320,000 — 1.6	389,000 + 31.4	5,063,000 — 9.9	6,226,000
Stocks, June 15	5,953,000 + 11.1	5,118,000 + 9.5	1,493,000 + 8.8	1,175,000 + 26.2	13,739,000 + 11.4	10,432,000
Ratio Sales to Prod	69.6%	81.8%	91.6%	61.5%	78.3%	90.4%
STOVE DISTILLATE—Gallons						
Stocks, June 8	1,722,000	2,216,000	477,000	58,000	4,473,000	3,957,000
Prod. 6-8 to 6-15	442,000 — 5.4	330,000 + 39.2	178,000 — 24.3	98,000 + 42.0	1,048,000 + 4.0	641,000
Ship. 6-8 to 6-15	232,000 — 62.5	292,000 + 57.8	226,000 +159.8	95,000 + 18.8	845,000 — 13.0	862,000
Stocks, June 15	1,932,000 + 12.2	2,254,000 + 1.7	429,000 — 10.1	61,000 + 5.2	4,476,000 + 4.5	3,736,000
Ratio Sales to Prod	52.5%	88.5%	127.0%	96.9%	80.6%	134.5%
GAS OIL—Gallons						
Stocks, June 8	8,565,000	34,372,000	1,959,000	5,667,000	50,563,000	45,797,000
Prod. 6-8 to 6-15	1,879,000 — 19.5	2,789,000 — 34.1	733,000 — 18.9	2,087,000 + 11.2	7,488,000 — 19.9	6,420,000
Ship. 6-8 to 6-15	1,000,000 — 42.2	134,000 — 95.4	1,046,000 + 0.5	2,005,000 + 3.9	4,185,000 — 44.7	5,043,000
Stocks, June 15	9,444,000 + 10.3	37,027,000 + 7.7	1,646,000 — 16.0	5,749,000 + 1.4	53,866,000 + 6.5	47,174,000
Ratio Sales to Prod	53.2%	4.8%	142.7%	96.1%	55.9%	78.6%
FUEL OIL—Gallons						
Stocks, June 8	18,808,000	42,423,000	43,553,000	20,360,000	125,144,000	106,103,000
Prod. 6-8 to 6-15	7,092,000 — 6.4	8,358,000 — 3.0	11,522,000 — 8.3	8,494,000 + 0.5	35,466,000 — 4.7	36,971,000
Ship. 6-8 to 6-15	7,070,000 + 16.8	6,579,000 — 9.7	14,095,000 + 42.4	8,460,000 — 11.6	36,204,000 +10.5	32,758,000
Stocks, June 15	18,830,000 + 0.1	44,202,000 + 4.2	40,980,000 — 5.9	20,394,000 + 0.2	124,406,000 — 0.6	110,316,000
Ratio Sales to Prod	99.7%	78.7%	122.3%	99.6%	102.1%	88.6%

Gasoline Produced by Various Methods, Week Ended June 15

	Kansas	% of Total	Oklahoma	% of Total	Texas	% of Total	Louisiana-Arkansas	% of Total	Total	% of Total
Straight Run	6,643,000	69.3	15,219,000	74.7	6,867,000	77.5	2,414,000	46.6	31,143,000	70.8
Cracked	2,275,000	23.7	4,007,000	19.7	1,414,000	15.9	2,161,000	41.7	9,857,000	22.4
Natural	673,000	7.0	1,134,000	5.6	585,000	6.6	607,000	11.7	2,999,000	6.8
Total	9,591,000		20,360,000		8,866,000		5,182,000		43,999,000	

+ or — columns are % change from previous week.

Rain Lowers Gasoline Demand and Stocks Pile Up

Staff Special—By Telegraph
TULSA, June 19

CONTINUATION of rainy weather in Mid-Continent trade territory in the week ended June 15 reduced demand for gasoline. Shipments from 80 refineries decreased more than 2,000,000 gallons to 41,922,000 gallons. This was the lowest volume of shipments reported since the first week of May. It is 7,000,000 gallons below the record shipments of 48,674,000 gallons in the week ended May 18.

Shipments of gasoline the last two months have averaged about 45,000,000 gallons a week. In the last eight weeks gasoline stocks at the 80 plants have been reduced 22,000,000 gallons. The larger part of the stock reduction was in the four weeks ended May 18. In the last four weeks the stock reduction has totaled 6,738,000

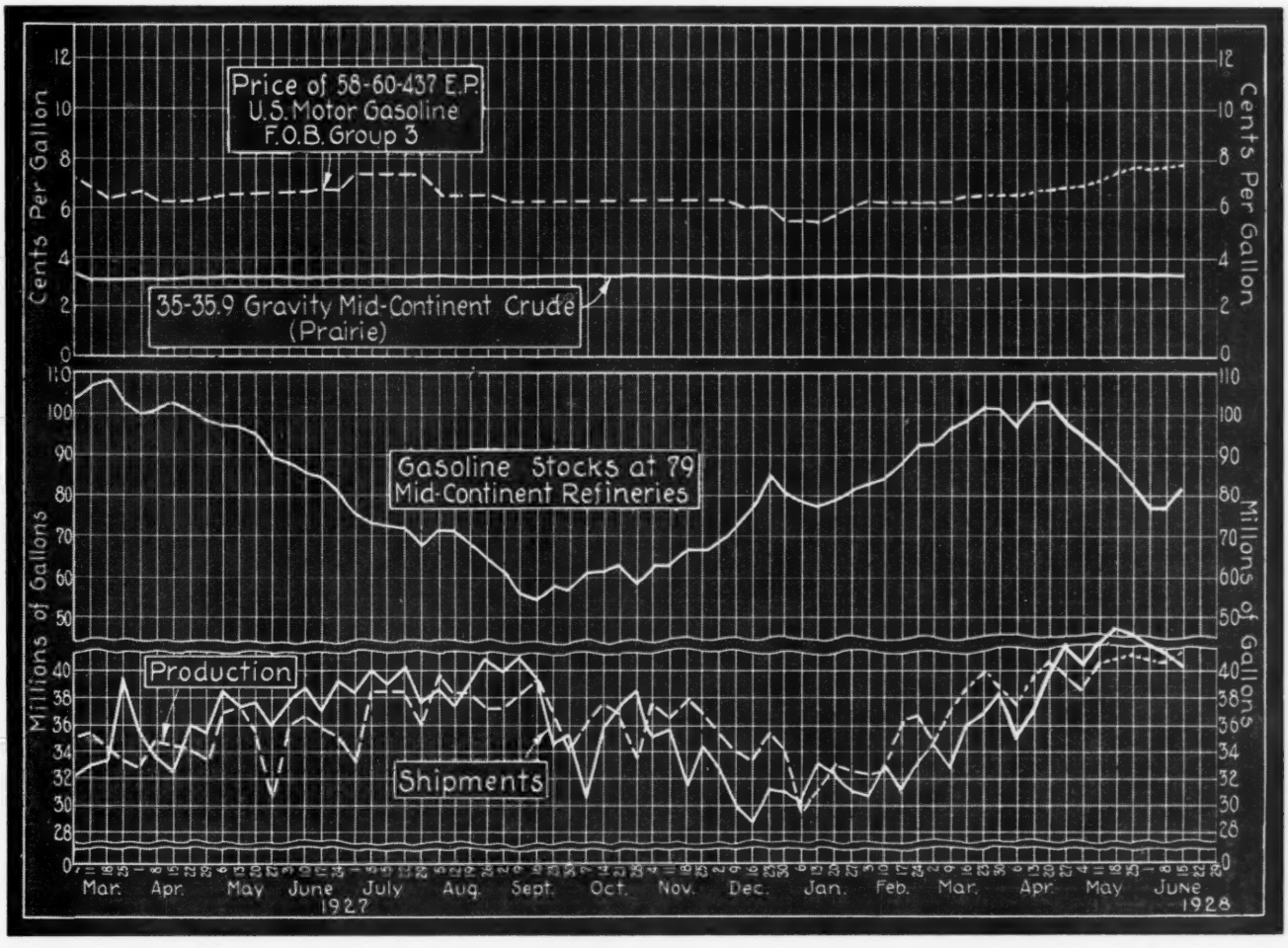
Summary for the Month

Production and shipments, all reporting refineries, for four weeks ended June 15. Change in stocks figured from May 18.

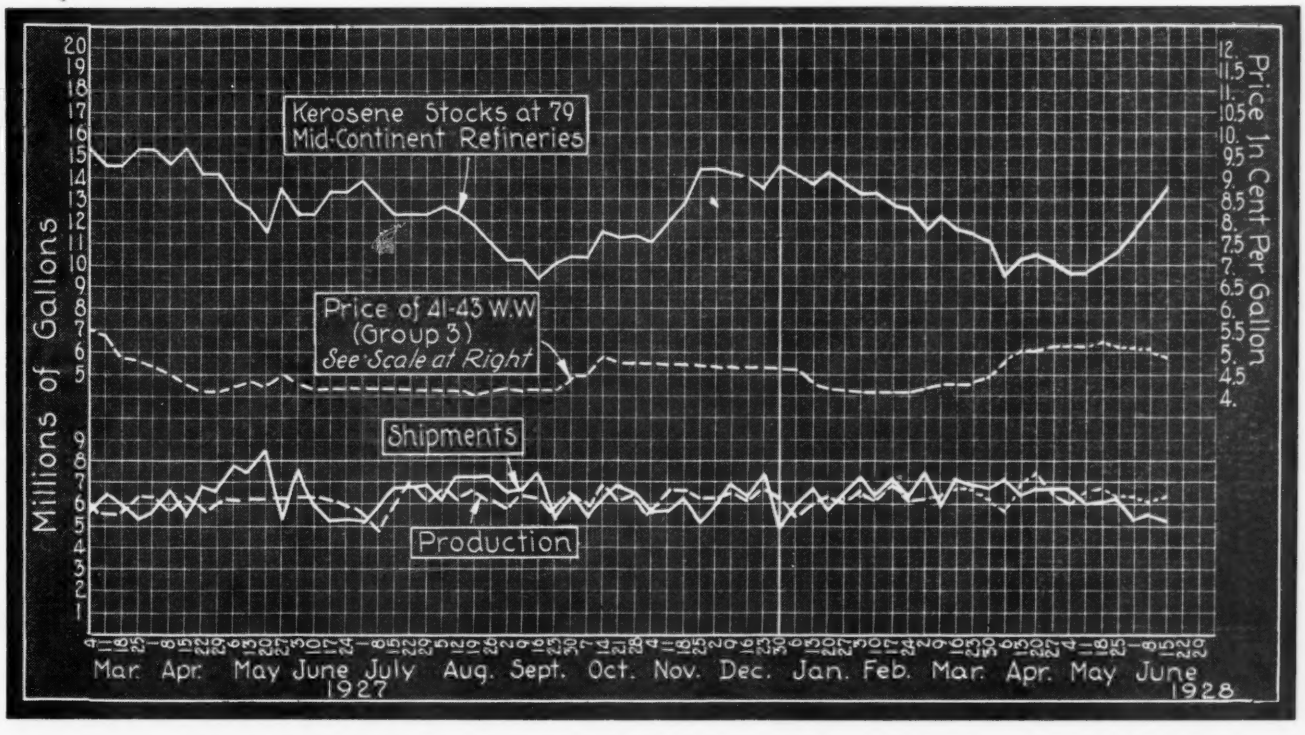
	Gallons
GASOLINE	
Production	173,987,000
Shipments	180,725,000
Net change in stocks	— 6,738,000
Ratio sales to production	107.2%
KEROSENE	
Production	25,361,000
Shipments	22,054,000
Net change in stocks	+ 3,307,000
Ratio sales to production	88.9%
STOVE DISTILLATE	
Production	3,791,000
Shipments	2,851,000
Net change in stocks	+ 940,000
Ratio sales to production	75.2%
GAS OIL	
Production	32,330,000
Shipments	25,638,000
Net change in stocks	+ 6,692,000
Ratio sales to production	79.3%
FUEL OIL	
Production	145,404,000
Shipments	131,314,000
Net change in stocks	+ 14,090,000
Ratio sales to production	90.3%

Barometer of Mid-Continent Refinery Market—Week Ending June 15

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 80 Plants to National Petroleum News

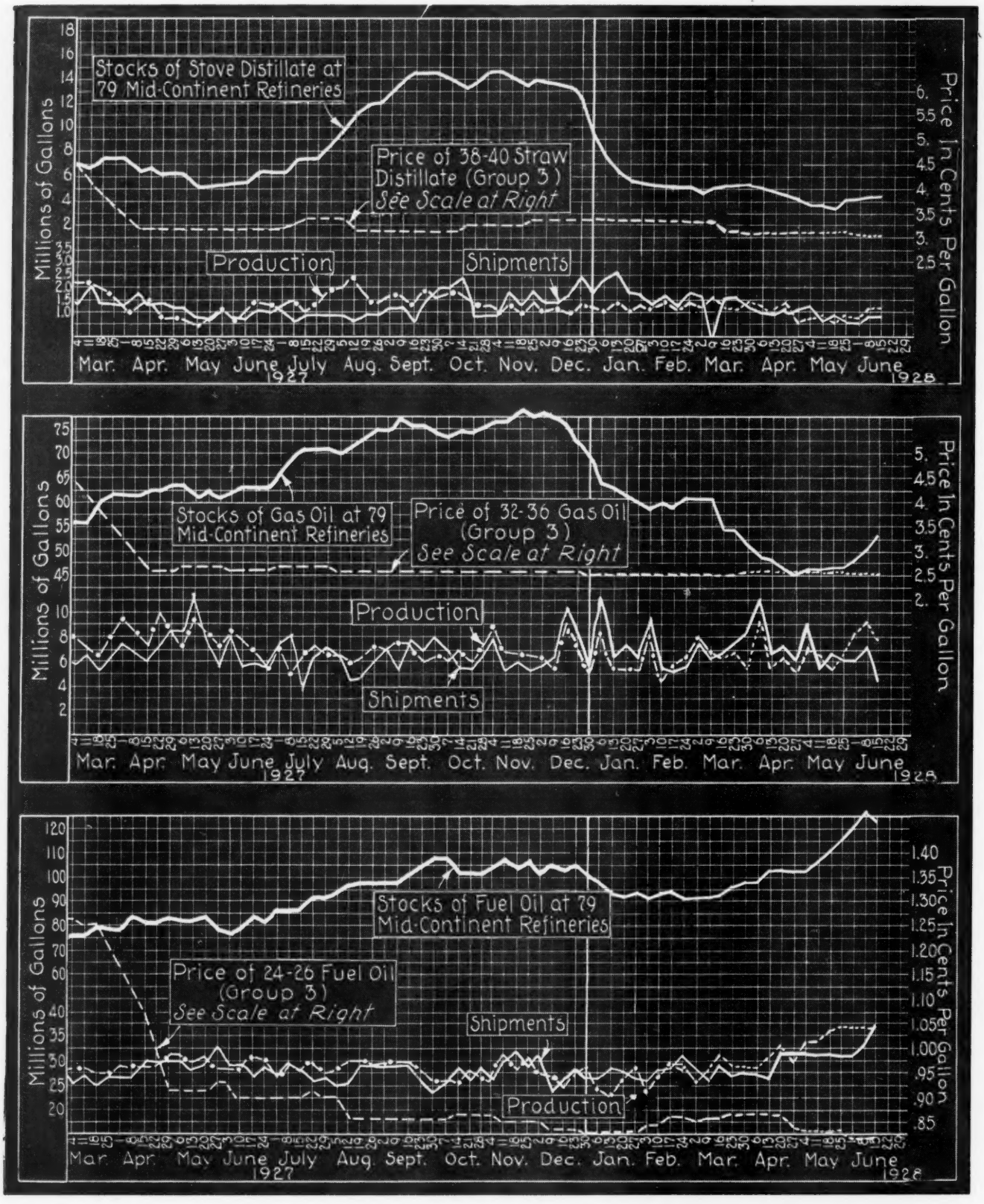

Price of 58-60-437 E.P. U.S. Motor Gasoline F.O.B. Group 3
35-35.9 Gravity Mid-Continent Crude (Prairie)
Cents Per Gallon
Gasoline Stocks at 79 Mid-Continent Refineries
Millions of Gallons
Production
Shipments
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Prices shown above are extended to date shown in Refinery Market and Crude tables in Market section of this issue and stocks, shipments and Production are extended to date shown in table on opposite page

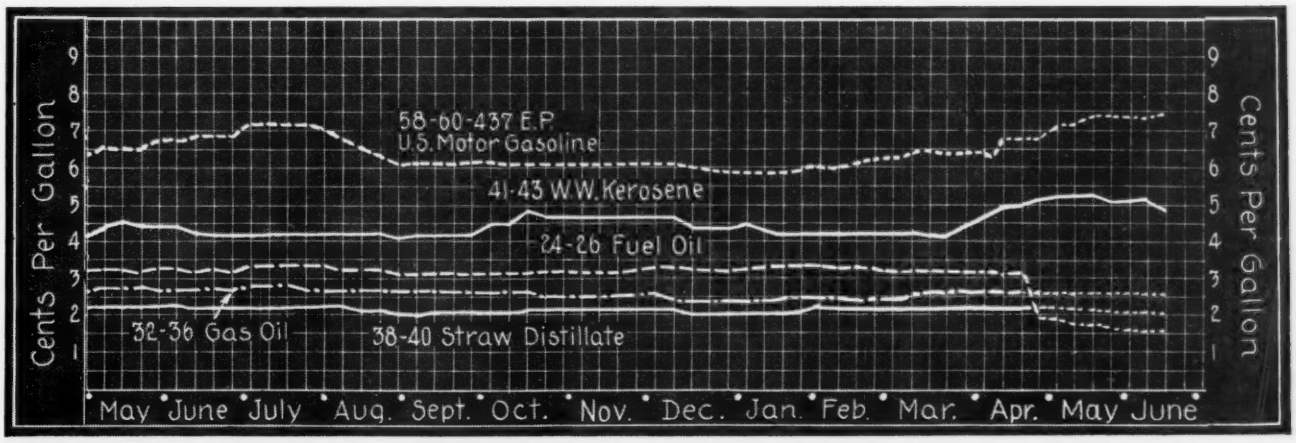

Kerosene Stocks at 79 Mid-Continent Refineries
Millions of Gallons
Price of 41-43 W.W. (Group 3) See Scale at Right
Price In Cent Per Gallon
Shipments
Production
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Barometer of Mid-Continent Refinery Market—Week Ending June 15

Charted Course of Prices, Production, Shipments, Stocks of Principal Refined Products, Week by Week, From Reports Made by 80 Plants to National Petroleum News


Stocks of Stove Distillate at 79 Mid-Continent Refineries
Price of 38-40 Straw Distillate (Group 3) See Scale at Right
Production
Shipments
Millions of Gallons
Price In Cents Per Gallon
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928
Stocks of Gas Oil at 79 Mid-Continent Refineries
Price of 32-36 Gas Oil (Group 3) See Scale at Right
Production
Shipments
Millions of Gallons
Price In Cents Per Gallon
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928
Stocks of Fuel Oil at 79 Mid-Continent Refineries
Price of 24-26 Fuel Oil (Group 3) See Scale at Right
Shipments
Production
Millions of Gallons
Price In Cents Per Gallon
Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
1927
1928

Current Prices of Principal Mid-Continent Refined Products


Cents Per Gallon
58-60-437 E.P. U.S. Motor Gasoline
41-43 W.W. Kerosene
24-26 Fuel Oil
32-36 Gas Oil
38-40 Straw Distillate
May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June
Cents Per Gallon

Prices shown are on Group 3 basis and extended to date shown in Refinery Market Tables Section of this Issue

gallons. The slackened rate at which refiners have been drawing on stocks, is because crude runs have been stepped up to take care of the unprecedented demand, particularly at plants where reserves were low when heavy export and domestic purchasing began.

An indication of the remarkable level of gasoline demand may be had by comparing current shipments with those in same period a year ago. In the four weeks ended June 17, 1927, shipments from the same group of plants totaled 150,663,000 gallons compared with 180,725,000 gallons for the four week period just ended.

In the last week the fall in gasoline shipments on account of weather conditions was not compensated by a reduction in production. The result was that stocks were increased approximately 2,000,000 gallons to 80,134,000 gallons. At the current rate of shipments stocks represent 13 days' supply. June 17, last year, stock totaled 86,010,000 gallons which represented 15 days' supply at the rate of consumption at that time.

The reduction in gasoline demand the last week was uniform throughout the field. No group drew on stocks but with the exception of Kansas every group shipped more than 95 per cent of its production for the week. In Kansas refiners shipped 92.5 per cent of their production.

Demand for kerosene fell and stocks increased 1,400,000 gallons to 13,739,000 gallons. A year ago kerosene stocks were 13,123,000 gallons.

Stocks of stove distillate rose 200,000 gallons to 4,676,000 gallons. Texas refiners drew on their stocks but all others increased theirs. A year ago stove distillate stocks totaled 6,263,000 gallons.

Stocks of gas oil increased 3,000,000 gallons to 53,866,000 gallons. In the last four weeks gas oil stocks have increased 6,692,000 gallons but are still 13,000,000 gallons below the level held in storage a year ago. Shipments for fuel oil jumped 3,431,000 gallons to 36,204,000 gallons. Production of fuel was down nearly 2,000,000 gallons to 35,466,000 gallons. Stocks were cut 738,000 gallons to 124,406,000 gallons. Kansas and Louisiana-Arkansas refiners reported virtually no change in fuel stocks and Texas refiners reported a 2,573,000-gallon cut in stocks. In Oklahoma stocks were increased 1,779,000 gallons. At the current rate of shipment fuel oil stocks now represent 24 days' supply.

I. C. C. Refuses Refund For High Rate Paid

WASHINGTON, June 18. — The Biblical injunction, "Put not your trust in princes," if amended by oil companies so as to substitute "railroads" for "princes," would save them money.

If Elliott Jones & Co., San Antonio, Texas, had had before it and observed the amended admonition, between April 6 and July 22, 1921, it would not have bidden a final farewell to between $9,000 and $10,000 it paid out as freight on gasoline shipped by it to points in the southeast, via Baton Rouge, La., on rates of 33 and 29.5 cents, in competition with refiners at Fort Worth, Wichita Falls and other Texas points, on a 19-cent rate to Vicksburg, Miss., for forwarding into the southeast.

The railroads that hauled the 145 carloads for Elliott Jones & Co., were willing to return the money but the Interstate Commerce Commission has just said no, in its most formal and forbidding manner.

The shipments were made on the assumption that the railroads, which later cut the rate to Baton Rouge to 19 cents, could return the difference. But the rate regulating body said that that fact did not prove there was discrimination against Elliott Jones & Co. because the railroads that company used on its traffic were not the ones that made the lower rate to Vicksburg. In other words the railroads that hauled the Jones gasoline did not violate any law by being so slow in meeting the competition of the railroads hauling to Vicksburg.

Elliott Jones & Co. paid about $65 a car on 131 cars more than its competitors in the southeast. The surplus paid on the other 14 cars brings the total to between $9,000 and $10,000.

Weighted Average Prices Oklahoma Market

On Feb. 6, 1928, National Petroleum News adopted the policy of publishing weighted average prices on the four more important gasolines in Oklahoma, instead of a range in prices. These weighted averages together with the number of cars of each grade sold, as of Monday, June 18, are published below. The figures are not available for publication in the refinery market table on page 122 of this issue.

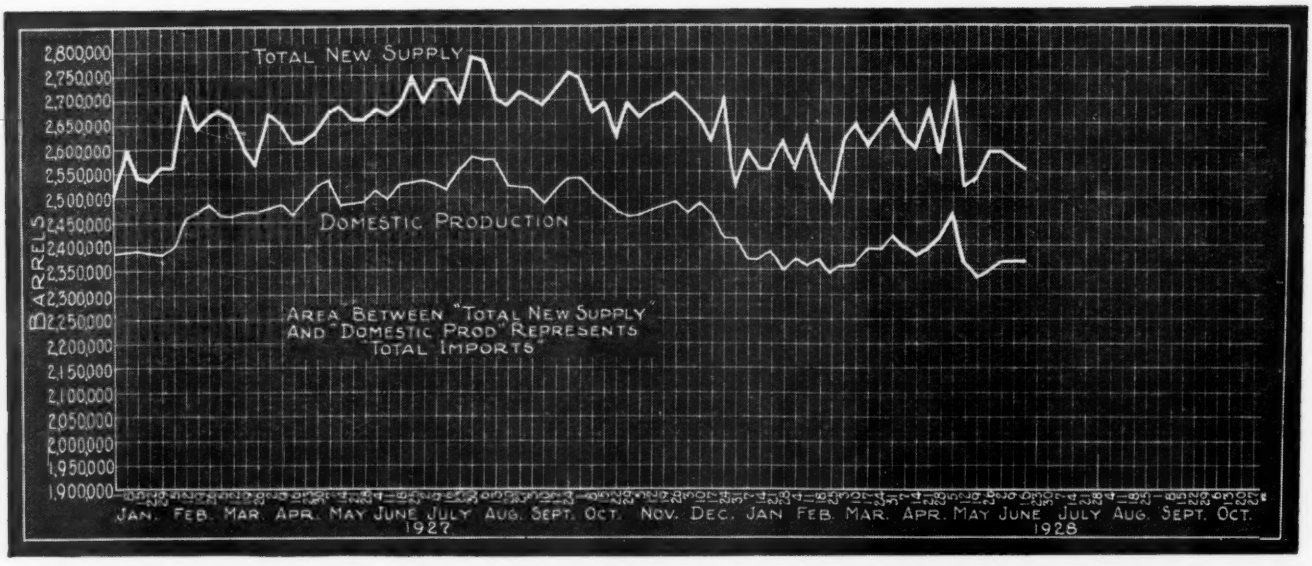
	Total Cars	Weighted Average
58-60 U. S. Motor, 437 e. p.	82	7.8033
60-62, 437 e. p.	21	7.7917
60-62, 400 e. p.	3	8.0000
64-66, 375 e. p.	2	8.1250

Note: Above prices are in cents per gallon, f.o.b. Oklahoma refinery in tank car lots.

TULSA, June 16.—During a severe rain and hail storm which swept over Kansas and Oklahoma late June 15, a gasoline storage tank at the Derby Oil Co. refinery at Wichita, Kans., was struck by lightning.

The tank immediately took fire, the blaze threatening a distillate and storage tank standing nearby toward which the flames were directed by a high wind. The tank contained approximately 175,000 gallons of 60-62, 400 end point gasoline.

Daily Average Crude Oil Production and Imports



Daily average gross output of United States, by fields, for week ending with dates below as compiled by American Petroleum Institute

PRODUCTION SUMMARY

	June 16	June 9
Production east of Rockies	1,716,450	1,719,000
Decrease		2,550
Total production in U. S.	2,358,450	2,363,800
Decrease		5,350
Crude oil imports	210,286	206,428
Increase		3,858
Total crude supply	2,568,736	2,570,228
Decrease		1,492

OKLAHOMA

	June 16	June 9
North Braman	2,900	2,900
South Braman	1,500	1,550
Blackwell	3,400	3,400
Hubbard	2,750	2,850
Thomas	1,250	1,350
Tonkawa	14,100	14,350
Garber	8,500	8,700
Burbank	32,100	32,750
Osage, outside Burbank	28,300	28,500
Watchorn	700	700
Cushing	20,000	20,050
Yale Jennings	8,950	9,000
Davenport	2,100	2,000
Bristow-Slick	22,450	22,650
North Okmulgee	15,350	15,400
Lyons-Deaner	6,500	6,550
Stroud	1,100	1,050
Cromwell	9,750	9,750
Papoose	4,250	4,400
Wewoka	6,550	6,550
Seminole	51,300	52,250
Bowlegs	62,700	62,550
Searight	13,850	14,700
Little River	43,750	44,500
Earlsboro	87,850	90,000
Duncan district	6,950	6,950
Graham	5,700	5,700
Fox	1,700	1,700
Healdton	13,900	13,950
Hewitt	9,300	9,300
Scholem Alechem	14,900	15,000
Others	94,500	85,600
Total Oklahoma	598,950	596,650
Increase		2,300

KANSAS

	June 16	June 9
Greenwood County	29,000	29,200
Florence-Covert	1,350	1,400
Peabody-Elbing	3,600	3,600
Eldorado-Towanda	14,000	14,000
Augusta-Fox-Bush	4,050	4,050
Rainbow Bend	1,600	1,600
Russell	3,500	3,500
Churchill	11,700	12,050
Oxford	11,950	12,400
Others	24,700	24,750
Total, Kansas	105,450	106,550
Decrease		1,100

NORTH LOUISIANA

	June 16	June 9
Homer	4,400	4,400
Haynesville	6,300	6,300
Caddo, light	9,650	9,600
Caddo, heavy	3,300	3,300
De Soto, Red River	4,200	4,200
Elm Grove	550	550
Bellevue	900	900
Cotton Valley, light	1,300	1,550
Cotton Valley, heavy	4,100	4,150
Urania	7,200	7,700
Pleasant Hill	600	600
Total, North Louisiana	42,500	53,250
Decrease		750

ARKANSAS

	June 16	June 9
El Dorado	5,300	5,350
Champagnolle	30,100	28,000
Smackover, light	7,600	7,850
Smackover, heavy	58,200	60,400
Stephens	1,050	1,050
Nevada	1,700	1,700
Lisbon	2,100	2,150
Others	100	100
Total, Arkansas	106,150	106,600
Decrease		450

TEXAS (Outside Gulf Coast)

Panhandle District

	June 16	June 9
Hutchinson County	37,050	36,000
Carson County	6,850	7,000
Gray County	20,050	19,200
Wheeler County	1,050	1,100
Others	150	100
Total, Panhandle District	65,150	63,400
Increase		1,750

North Texas

	June 16	June 9
Burkburnett	10,200	10,500
Electra	13,300	13,200
Iowa Park and K-M-A	3,800	3,850
Wilbarger	16,500	15,000
Archer County	21,250	21,500
Montague-Cooke	12,000	12,200
Others	650	600
Total, North Texas	77,700	76,850
Increase		850

West Central Texas

	June 16	June 9
Stephens County	7,800	7,850
Eastland-Desdemona	7,500	7,600
Brown County	12,850	13,050
Coleman County	2,600	1,900
Callahan County	3,300	3,800
Shackleford County	10,200	9,900
Young County	8,000	7,350
Throckmorton County	950	1,000
Palo Pinto County	450	350
Jack County	1,350	1,300
Others	650	650
Total, West Central Texas	55,650	54,750
Increase		900

West Texas

	June 16	June 9
Jones County	1,300	1,350
Mitchell and Scurry Counties	3,000	2,950
Howard County	4,600	4,500
Reagan County	17,700	17,500
Crane and Puton Counties	67,500	68,000
Crockett County	2,200	2,250
Pecos County	52,000	53,000
Winkler County	143,200	143,000
Others	1,750	1,850
Total, West Texas	293,250	294,400
Decrease		1,150

East Central Texas

	June 16	June 9
Mexia	6,700	6,850
Currie	500	500
Richland	500	500
Wortham	1,900	1,850
Corsicana-Powell	11,000	11,100
Nigger Creek	1,250	1,250
Total, East Central Texas	21,850	22,050
Decrease		200

Southwest Texas

	June 16	June 9
Luling	13,650	13,050
Lytton Springs	1,100	1,300
Somerset	700	700
Laredo District	6,000	5,700
Piedras Pintas	.....	.....
Dale	1,300	1,050
Others	400	400
Total, Southwest Texas	23,150	22,200
Increase		950
Total, Texas—(Outside Gulf Coast)	536,750	533,650
Increase		3,100

GULF COAST

Coastal Texas

	June 16	June 9
West Columbia	8,400	7,950
Damon Mound	850	850
Big Creek	1,450	1,450
Boling	2,500	2,650
Blue Ridge	5,850	5,850
Pierce Junction	11,000	11,950
Humble	1,500	1,100
Goose Creek	7,100	7,200
South Liberty	5,000	4,350
Hull	11,600	12,050
Saratoga	1,100	1,100
Batson	1,000	1,400
Barber's Hill	700	700
Sour Lake	3,400	3,400
Spindletop	40,050	41,900
Orange County	4,250	4,400
Others	1,750	1,700
Total, Coastal Texas	107,500	110,000
Decrease		2,500

Coastal Louisiana

	June 16	June 9
Vinton	4,700	4,600
Sulphur Dome	4,900	.....
Lockport	4,000	4,050
Sweetlake	3,800	.....
Evangeline	1,000	900
East Hackberry	5,450	5,150
Edgerly	1,250	950
Sorrento Dome	2,100	.....
Others	950	13,400
Total, Coastal Louisiana	28,150	29,050
Decrease		900
Total, Gulf Coast	135,650	139,050
Decrease		3,400

ROCKY MOUNTAIN

Wyoming

	June 16	June 9
Salt Creek	43,050	43,250
Grass Creek	2,500	2,500
Elk Basin	1,000	1,150
Big Muddy	2,650	2,600
Lost Soldier	4,300	4,300
Rock Creek	600	2,650
Lance Creek	650	650
Teapot Dome	.....	.....
Others	6,700	6,300
Total, Wyoming	61,450	63,400
Decrease		1,950

Montana

	June 16	June 9
Cat Creek	1,750	1,750
Sunburst	8,800	8,800
Others	150	150
Total, Montana	10,700	10,700

Colorado

	June 16	June 9
Moffat (Craig)	1,100	1,000
Fort Collins	2,500	2,700
Florence	1,100	1,200
Others	2,700	2,100
Total, Colorado	7,400	7,000
Increase		400

New Mexico

	June 16	June 9
Table Mesa	350	.....
Hogback	200	200
Artesia	1,250	1,250
Rattlesnake	450	.....
Others	200	200
Total, New Mexico	2,450	1,650
Increase		800
Total, Rocky Mountain	82,000	82,750
Decrease		750

CALIFORNIA

	June 16	June 9
Santa Fe Springs	36,000	36,000
Long Beach	200,000	198,500
Huntington Beach	54,500	55,000
Torrance	17,500	18,000
Dominguez	12,000	12,000
Rosecrans	6,000	6,000
Inglewood	29,000	29,000
Midway-Sunset	70,500	73,500
Ventura Avenue	49,000	47,500
Seal Beach	36,500	37,500
Others	131,000	131,800
Total, California	642,000	644,800
Decrease		2,800

EASTERN

	June 16	June 9
(Including Ill., Ind., Ky., Ohio, W. Va., Pa., and N. Y.)	109,000	110,500
Decrease		1,500

Operators Plan Orderly Development Of New Rainbow, Ark., Pool

TULSA, June 18

INTEREST in Mid-Continent producing operations during the last week has centered in Arkansas and in districts adjacent to the various Seminole fields, particularly in the Pearson-St. Louis district and in the Mission district west of Bowlegs where the Gypsy Oil Co. began the week with a large Wilcox sand well.

Preliminary discussions looking toward an orderly development of the Rainbow* or Champagnolle field in

By J. C. Chatfield
N. P. N. STAFF WRITER

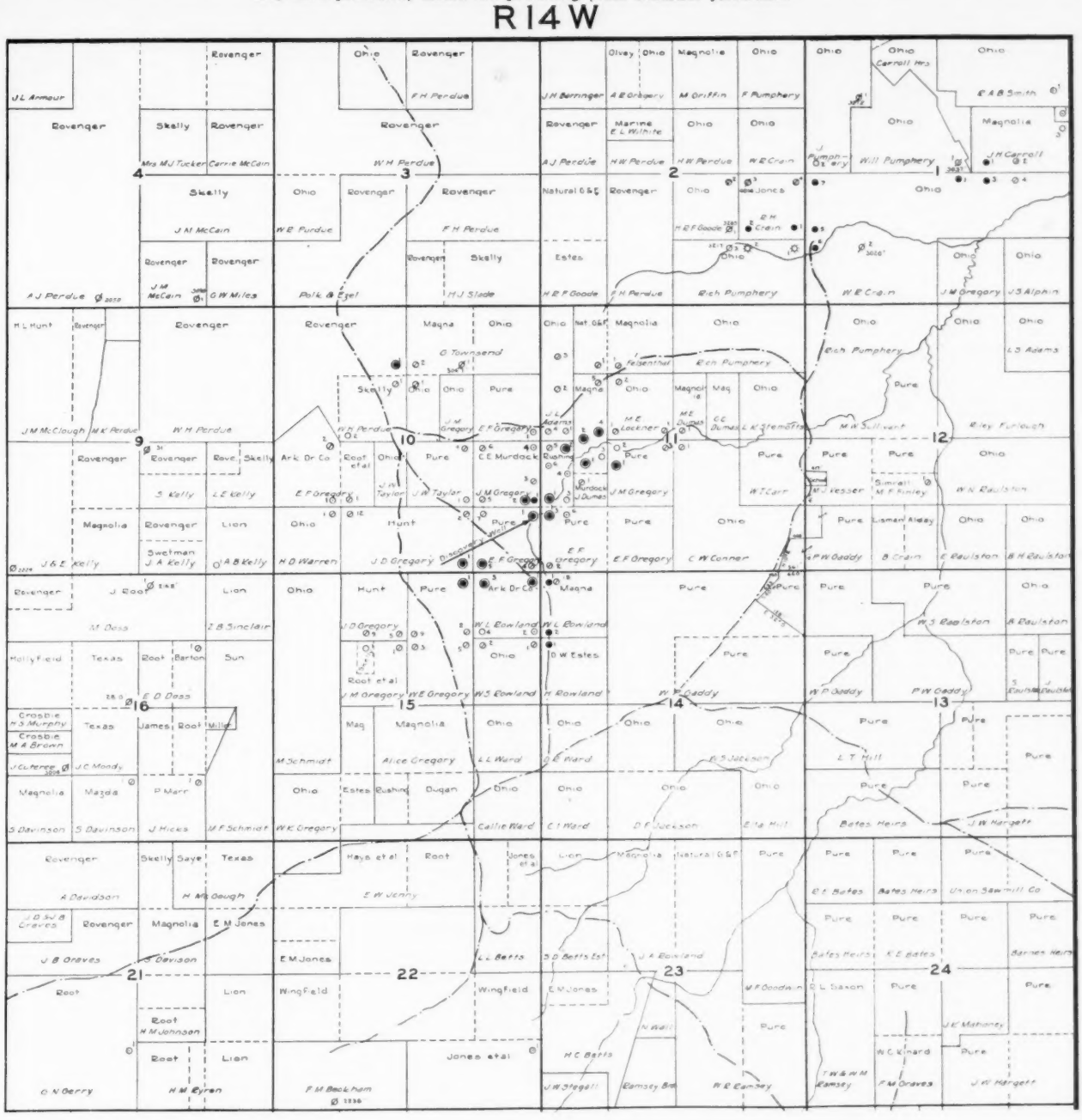
Arkansas were started at El Dorado June 15 at an open meeting called by the Arkansas state conservation department. As a result of this meeting a committee of operators is to be formed which will make a careful study of conditions in the field and work with the state commission in case there appears to be any reason to fear that facilities will not be adequate to take care of production.

In the week ended June 15 production of the field was maintained at approximately 27,000 barrels a day. Five new wells were added to the list of producers to make up for the decline of the 14 wells which were producing the previous week. An accompanying tabulation gives a gauge of all wells in the deep sand

(*Continued on Page* 61)

*See "Rainbow Pool Brings Arkansas Boom," NATIONAL PETROLEUM NEWS, June 13, 1928, p. 17.

Map of part of Twp. 17S-14W, Union county, Ark., showing Rainbow pool development about 10 miles northeast of Eldorado. Wells circled are deep sand producers; others are producing from shallower formations



Seminole District Production by Companies and Leases, June 13 and June 6, 1928

BOWLEGS

Company	Farm	S.T.R.	June 13 Wells	June 13 Prod.	June 6 Wells	June 6 Prod.
Amerada	Rascoe	15-8-6	8	1460	8	1,370
Atlantic	Baker	1-8-6	4	340	4	300
Atlantic	Fleet	23-8-6	3	410	3	395
Atlantic	Grayson	21-8-6	4	609	4	525
Atlantic	A. Jones	10-8-6	2	50	2	80
Atlantic	C. Jones	9-8-6	2	255	2	245
Total Atlantic			15	1,644	15	1,545
Barnsdall	McNac	28-8-6	1	25	1	25
Barnsdall	Murrow	11-8-6	4	754	4	769
Total Barnsdall			5	779	5	794
Carter	Bowlegs	15-8-6	4	1,255	4	1,255
Carter	Burden	23-8-6	3	255	3	230
Carter	Harjoche	15-8-6	6	390	6	545
Carter	Hilly	23-8-6	3	700	3	690
Carter	Jones	11-8-6	4	845	4	935
Carter	McGeisey	21-8-6	1	20	1	20
Carter	Walker	15-8-6	4	505	4	510
Carter	Wise	23-8-6	11	2,145	11	2,230
Total Carter			38	6,115	38	6,415
Dixie	Culley	11-8-6	1	85	1	90
Empire	Lacey	15-8-6	6	338	6	462
Empire	Wise	23-8-6	2	307	2	370
Total Empire			8	645	8	832
Gypsy	Bowlegs	22-8-6	1	0	1	170
Gypsy	Bradley	8-8-6	1	0	1	2
Gypsy	Cumsey	8-8-6	4	1,122	4	1,190
Gypsy	Dosar	7-8-6	1	100	1	100
Gypsy	Grayson	13-8-6	4	667	4	485
Gypsy	Harjoche	10-8-6	3	1,397	3	1,435
Gypsy	Jones	11-8-6	1	55	1	0
Gypsy	Walker	15-8-6	8	1,533	8	1,635
Gypsy	Mission	5-8-6	1	3,210	0	0
Gypsy	Wise	23-8-6	2	312	2	300
Total			26	8,396	25	5,317
I.T.I.O.	Barnett	23-8-6	2	312	2	366
I.T.I.O.	Barnett-B	24-8-6	1	301	1	226
I.T.I.O.	Billington	22-8-6	5	565	5	678
I.T.I.O.	Bowlegs	22-8-6	10	1,302	10	1,328
I.T.I.O.	Davis	22-8-6	4	936	4	1,049
I.T.I.O.	Fay	13-8-6	9	2,227	9	2,130
I.T.I.O.	Goforth	15-8-6	12	1,453	12	1,700
I.T.I.O.	Livingston	15-8-6	10	3,061	10	3,222
I.T.I.O.	Lizzie	13-8-6	3	624	3	619
I.T.I.O.	Walker	15-8-6	8	721	8	624
I.T.I.O.	Wilmott	15-8-6	4	360	4	420
I.T.I.O.	Work	24-8-6	1	129	1	129
Total I.T.I.O.			71	12,013	71	12,571
Magnolia	Davis	13-8-6	3	518	3	547
Magnolia	Davis-M	13-8-6	1	246	1	277
Magnolia	Hammond	10-8-6	5	781	5	874
Magnolia	Rhodes	12-8-6	5	3,412	5	3,809
Magnolia	Van Buskirk	9-8-6	1	201	1	266
Total Magnolia			15	5,158	15	5,773
McCulloch	Bowlegs	22-8-6	2	420	2	400
Mid-Continent	Baker	10-8-6	4	1,080	4	1,100
Mid-Continent	Bowlegs	22-8-6	1	15	1	35
Mid-Continent	Smith	12-8-6	6	515	6	515
Total Mid-Continent			11	1,610	11	1,650
Minnehoma	Bowlegs	15-8-6	4	264	4	285
Prairie	Gahagan	23-8-6	4	357	4	307
Prairie	Harber	10-8-6	8	2,570	8	2,625
Prairie	Jones	11-8-6	4	340	4	490
Prairie	Templeton	12-8-6	6	2,300	6	2,365
Prairie	Whitney	23-8-6	4	455	4	530
Total Prairie			26	5,022	26	6,317
Pure	Reed	14-8-6	14	3,068	14	3,272
Pure	Strother-D	14-8-6	4	588	4	715
Pure	Strother-F	10-8-6	5	2,026	5	1,737
Total Pure	23		23	5,682	23	5,724
Roxana	Taylor	16-8-6	5	120	5	117
Shaffer	Lacy	14-8-6	3	335	3	307
Sinclair	Bowlegs	22-8-6	1	90	1	90
Sinclair	Cumsey	10-8-6	4	2,649	4	2,834
Sinclair	Ellen	11-8-6	7	1,164	7	1,145
Sinclair	Harjo	14-8-6	3	790	3	370
Sinclair	Jones	10-8-6	7	1,343	7	1,455
Sinclair	Taylor	10-8-6	4	1,846	4	1,736
Sinclair	Tayfor-W	10-8-6	3	1,395	3	1,192
Sinclair	Walker	22-8-6	4	887	4	932
Total Sinclair			33	10,164	33	9,754
Texas	Reed	14-8-6	11	1,835	11	2,015
Tidal	Grayson	13-8-6	4	410	4	495
Tidal	Harjoche	10-8-6	6	1,385	6	1,415
Total Tidal			10	1,795	10	1,910
Twin State	Jones	11-8-6	3	57	3	63
Total Bowlegs			317	64,517	316	63,243

EARLSBORO

Company	Farm	S.T.R.	June 13 Wells	June 13 Prod.	June 6 Wells	June 6 Prod.
Amerada	Anderson	15-9-5	2	975	2	1,050
Amerada	Cowden	4-9-5	7	1,735	7	1,825
Amerada	Rogers	3-9-5	2	1,095	2	1,080
Total Amerada			11	3,805	11	3,955
Atlantic et al	Foreman	18-9-5	1	160	1	160
Barnsdall	Brown	10-9-5	4	2,997	4	2,293
Barnsdall	F. Bruner	2-9-5	2	734	2	641
Barnsdall	N. Bruner	10-9-5	3	952	4	1,062
Barnsdall	Cudjo	14-9-5	1	26	1	26
Barnsdall	D. Davis	11-9-5	3	243	3	328
Barnsdall	J. Davis	11-9-5	4	1,080	4	1,066
Barnsdall	M. Davis	11-9-5	3	97	3	95
Barnsdall	Gibson	9-9-5	8	2,813	8	2,511
Barnsdall	Hern	15-9-5	1	14	1	3
Barnsdall	Ingram	1-9-5	8	2,810	8	3,145
Barnsdall	Pack	10-9-5	4	158	4	202
Barnsdall	Peter	10-9-5	4	225	4	200
Barnsdall	Sango	1-9-5	5	6,096	5	6,248
Barnsdall	Sebolka	15-9-5	1	527	1	293
Barnsdall	H. Sullivan	11-9-5	1	0	1	18
Barnsdall	Sull-Harjo	10-9-5	2	41	2	61
Barnsdall	Watsutke	12-9-5	4	1,794	4	1,806
Total Barnsdall			58	20,607	59	19,998
Carter	Davis	13-9-5	2	450	2	400
Carter	Sango	1-9-5	4	810	4	950
Total Carter			9	1,260	9	1,350
Continental	Kays	2-9-5	2	50	2	120
Continental	Spencer	12-9-5	4	1,330	4	1,225
Total Continental			6	1,380	6	1,345
Empire	Barker	12-9-5	1	420	1	460
Empire	Edmundson	3-9-5	3	30	3	70
Total Empire			4	450	4	530
Gypsy	Bruner	10-9-5	4	2,935	4	2,645
Gypsy	B. Carter	11-9-5	9	2,760	9	3,255
Gypsy	Earl	16-9-5	1	17	1	17
Gypsy	Hunick	5-9-5	1	2,125	1	2,287
Gypsy	Noble	12-9-5	4	2,700	4	2,780
Gypsy	Peter	10-9-5	3	420	3	427
Gypsy	Sango	1-9-5	5	2,232	5	3,362
Gypsy	State	16-9-5	4	1,108	4	1,125
Total Gypsy			31	14,297	31	15,898
Independent	Bruner	10-9-5	4	390	4	240
Independent	Sullivan	10-9-5	2	84	2	111
Independent	Knapp	8-9-5	4	2,261	4	2,228
Indep.-Margay	Gaines	11-9-5	4	676	4	830
Total Independent			14	3,411	14	3,409
Magnolia	Bryant	9-9-5	6	970	6	1,098
Magnolia	Cowden	4-9-5	4	70	4	70
Magnolia	Edmundson	3-9-5	3	30	3	30
Magnolia	Holmsley	11-9-5	7	404	7	435
Magnolia	Hyde	13-9-5	1	1,721	1	1,737
Magnolia	Ingram	10-9-5	1	25	1	25
Magnolia	Lena	10-9-5	3	70	3	80
Magnolia	Seay	12-9-5	9	3,000	9	3,416
Magnolia	Simpson	10-9-5	3	173	3	188
Magnolia	Sparks	11-9-5	7	612	7	632
Magnolia	Sullivan	12-9-5	3	108	3	90
Total Magnolia			47	7,183	47	7,791
Mid-Continent	McCumber	9-9-5	7	90	7	110
Mid-Kansas	Anderson	14-9-5	3	100	3	90
Phillips	Dunnaway	14-9-5	1	30	1	30
Phillips	Gram	9-9-5	2	125	2	105
Total Phillips			3	155	3	135
Prairie	Baker	24-9-5	1	50	1	50
Prairie	Davis	13-9-5	5	3,140	5	3,370
Prairie	C. Graham	3-9-5	2	30	2	30
Prairie	O. Graham	10-9-5	4	1,175	4	135
Prairie	Stidham	11-9-5	13	3,950	13	4,040
Total Prairie			25	8,345	25	7,625
Roxana	Bayliss	17-9-5	1	15	1	15
Roxana	Spencer	12-9-5	2	805	2	1,359
Total Roxana			3	820	3	1,374
Shaffer	Clark	1-9-5	4	907	5	730
Sinclair	Foreman	18-9-5	1	5	1	15
Sinclair	Hollins	12-9-5	1	20	1	50
Sinclair	Sango	2-9-5	3	3,945	3	4,000
Total Sinclair			5	3,970	5	4,065
Skelly	Sherry	6-9-5	1	3,862	1	471
Skelly	Spencer	12-9-5	1	606	1	3,949
Total Skelly			2	4,468	2	4,420
Superior	Walker	2-9-5	1	4,125	1	4,119
Texas	Anderson	2-9-5	7	470	7	530
Texas	Brown	10-9-5	8	1,905	8	1,930
Texas	Rogers	5-9-5	4	3,255	4	3,520
Texas	Wilmott	10-9-5	7	545	7	590
Total Texas			26	6,175	26	6,570
Tidal	Watkins	9-9-5	7	3,215	7	3,445
Twin State	Barker	12-9-5	2	100	2	107
Twin State	Hern	2-9-5	4	1,430	4	1,315
Total Twin State			6	4,745	6	1,422
TOTAL EARLSBORO			276	86,447	278	89,541

LITTLE RIVER

Company	Farm	S.T.R.	June 13 Wells	June 13 Prod.	June 6 Wells	June 6 Prod.
Amerada	Nitey	2-7-6	3	1,935	3	2,095
Amerada et al	Fore	35-8-6	2	455	2	525
Total Amerada			5	2,390	5	2,620
Barnsdall	Hotulke	22-7-6	1	36	1	35
Blackwell	Nitey	35-8-6	6	2,763	6	3,233
Carter	Fish	36-8-6	6	1,080	6	1,150

(*Continued on Page 59*)

Seminole District Production by Companies and Leases, June 13 and June 6, 1928

(Continued from Page 58)

Company	Farm	S.T.R.	June 13 Wells	June 13 Prod.	June 6 Wells	June 6 Prod.
Carter	Jackson	11-7-6	2	1,905	2	1,925
Carter	Larney	24-7-6	1	100	1	100
Carter	Wilson	12-7-6	1	100	1	100
Total Carter			10	3,185	10	3,275
Continental	Cosar	36-8-6	4	1,720	4	1,555
Gypsy	Brown	33-8-6	1	50	1	50
Gypsy	Conard	22-7-6	1	100	1	100
Gypsy	Campbell	36-8-6	2	192	2	200
Gypsy	Denmark	11-7-6	1	100	1	100
Gypsy	Nungee	1-7-6	1	30	1	25
Gypsy	Hulhoke	14-7-6	1	100	1	100
Gypsy	Pottie	35-8-6	4	1,592	4	1,672
Gypsy	Renton	11-7-6	3	2,647	3	2,217
Total Gypsy			14	4,811	14	4,464
Independent	Harris	23-7-6	2	200	2	200
Independent	Davis	2-7-6	3	2,435	3	2,585
Total Independent			5	2,635	5	2,785
I.T.I.O.	Campbell	1-7-6	1	51	1	51
I.T.I.O.	Dungan	35-8-6	3	1,647	3	1,759
I.T.I.O.	MA House	1-7-6	1	259	1	205
I.T.I.O.	WE House	1-7-6	1	54	1	80
I.T.I.O.	WE House-B	2-7-6	4	1,852	4	1,883
I.T.I.O.	Hull	26-8-6	1	2,141	2	549
I.T.I.O.	Jackson	1-7-6	3	1,420	3	1,587
I.T.I.O.	McCulla	1-7-6	3	697	3	737
I.T.I.O.	Nitey	2-7-6	6	829	6	779
I.T.I.O.	Phoebe-A	36-8-6	3	657	3	678
I.T.I.O.	Phoebe-B	36-8-6	4	155	4	162
I.T.I.O.	Reed	1-7-6	1	51	1	51
I.T.I.O.	Soketheche	1-7-6	3	807	4	860
Total I.T.I.O.			34	10,620	36	9,381
Magnolia	Cruse	2-7-6	4	1,603	4	1,785
Man	Reed	22-7-6	1	100	1	116
Magnolia	Pottie	35-8-6	3	575	3	600
Total Magnolia			8	2,278	8	2,501
Mid-Continent	Bruner	11-7-6	1	100	1	100
Mid-Continent	Smith	5-7-7	1	30	1	30
Mid-Continent	Wadswotrh	36-8-6	7	725	7	750
Total Mid-Continent			9	855	9	880
W. B. Pine	Hoyecha	26-8-6	1	680	1	420
Pine et al	Pottie	36-8-6	2	712	2	710
Total Pine			3	1,392	3	1,130
Pure	Harjo	11-7-6	1	2,787	1	2,773
Prairie	Chilcoat	25-8-6	1	635	1	650
Prairie	Dungan	35-8-6	1	75	1	80
Prairie	House	2-7-6	4	1,135	4	1,240
Total Prairie			6	1,845	6	1,970
Reiter-Foster	Bunyard	14-7-6	1	100	1	100
Roxana	Caesar	11-7-6	1	249	1	254
Roxana	Hotulke	23-7-6	1	69	1	71
			2	318	2	325
Shaffer	Narcome	36-8-6	1	0	1	50
Sinclair	Cosar	36-8-6	3	3,560	3	3,500
Sinclair	Teewee	14-7-6	1	100	1	100
Total Sinclair			4	3,660	4	3,600
Slick	Williams	13-7-6	1	100	1	100
Snowden-McS	Tiger	13-7-6	1	0	1	640
Superior	Soketheche	1-7-6	1	10	1	13
Texas	Coker	1-7-6	3	1,745	4	1,810
Texas	Hotulke	23-7-6	1	100	1	125
Total Texas			4	1,845	5	1,935
Tidal	House	1-7-6	3	720	3	755
Tidal	Johnson	1-7-6	1	45	1	55
Total Tidal			4	765	4	810
TOTAL LITTLE RIVER			127	44,097	129	44,175

SUMMARY

TOTAL LITTLE RIVER	**127**	**44,097**	**129**	**44,175**
TOTAL BOWLEGS	**317**	**64,517**	**316**	**63,243**
TOTAL EARLSBORO	**276**	**86,447**	**278**	**89,541**
TOTAL SEMINOLE	**303**	**51,673**	**303**	**53,499**
TOTAL SEARIGHT	**69**	**13,762**	**69**	**14,975**
GRAND TOTAL SEMINOLE AREA	**1,094**	**260,496**	**1,095**	**265,433**

Completions in Oklahoma and Kansas, Week Ended June 16, 1928

OKLAHOMA

Carter County

Company	Well No.	Location	Depth	Init. Prod.
Atlantic	2	SEc NE SE 19-1-3 W	2965-3437	250
Roxana	2	NEc SW SW 20-1-3 W	2833-3465	140
Magnolia	3	SWc NE NW 23-1-3 W	2347-2403	120
Hall-Briscoe	1	SWc NW NW 29-1-3 W	2803-3156	75
Franklin	1	NWc SE 11-2-3 W	3330-3359	175

Cleveland County

Cromwell-Franklin	1	C SW 22-10-2 W	T.D. 4706	Dry

Creek County

Gibson-Becker et al.	4	SWc 17-17-7 E	T.D. 2798	Dry
Shaffer	13	NEc SW NW 17-17-7 E	T.D. 1610	Dry
McCulloch	1	NWc NE NE 22-18-11 E	T.D. 2155	Dry
Adams et al	3	NEc SW 20-17-10 E	T.D. 2997	Dry
Magnolia	31	NEc NW SW NW 16-18-7 E	2483-2540	125
Buckles	2	CWL NE SE 22-18-8 E	1288-1301	5
Gibson-Becker et al.	3	NWc SW 17-17-7 E	2785-2817	525
Bu-Vi-Bar	2	SEc NE 18-17-7 E	2844-2871	20
Glenora	4	NEc NW NW 23-17-8 E	2763-2774	2M
National	4	SWc NE SE 1-19-9 E	2028-2072	200
Devonian	3	CNL S½ SE NW 4-18-12 E	1727-1750	7½M
Jackson-Wise	1	SEc NW NE 3-17-11 E	1953-1958	½M
Enfiscoe	1	NEc SE 12-17-12 E	1871-1887	8

Grady County

Carter	7	NWc NE NW 26-5-8 W	2013-2060	25M

Hughes County

I. T. I. O.	1	NWc SE SW 8-5-8 E	2720-2761	OWD 200
Noble et al	1	SEc 20-5-9 E	T.D. 3015	Dry

Jefferson County

Magnolia	3	NWc 25-6-6 W	T.D. 2945	Dry

Kay County

McDorman et al	1	SEc NE SW SW 12-28-1 W	T.D. 844	Dry
Burnham-McGraw	1	NEc NW SE 29-29-1 E	850-956	1.7M
McDorman et al	1	SWc NW NW SE 12-28-1 W	783-790	.68M
Goines et al	1	NWc SW 24-28-1 W	1010-1025	.25M

Muskogee County

Bryan-Emery	2	SWc SE NE 8-15-15 E	1608-1612	80
Bryan-Emery	3	C SE NE 8-15-15 E	1611-1615	130
Boyle et al	2	NWc SW 9-15-15 E	1619-1621	60
Hogan-Lammers	1	SWc NW NW 36-15-18 E	946-953	½M
Jolly	2	C NE NW 2-14-18 E	1790-1840	7
Sells	2	SWc SE NE SW 6-14-19 E	517-537	15
Bradley	2	NEc SW 21-15-19 E	T.D. 1108	Dry
Nixon	1	NWc NE NW SE 13-14-18 E	T.D. 810	Dry

Okfuskee County

Deaner et al	3	NEc SE SW 3-12-11 E	T.D. 2620	Dry
Riverland	2	CSL SE SW 19-11-11 E	3650-3682	150
Devonian	1	SEc SW NE 11-10-11 E	1569-1589	60

Okmulgee County

Mechlin et al	7	CWL SE NE 14-14-14 E	1060-1075	15
Fair	7	CS½ SE 36-13-11 E	T.D. 2540	Dry
Pine	1	NEc NW NW 6-12-14 E	T.D. 2816	OWD Dry

Osage County

Company	Well No.	Location	Depth	Init. Prod.
Link	1	CNL SE 34-25-9 E	T.D. 2274	Dry
Devonian	1	SEc SW NE 5-24-9 E	T.D. 2705	Dry
McCune-Wormser et al.	8	NWc NE SE NW 15-24-8 E	463-499	8

Pontotoc County

Coleman	1	NEc SW SE 25-5-6 E	2096-2190	50
Westheimer-Daube	2	C W½ E½ 19-5-8 E	2577-2594	468

Pottawatomie County

Magnolia	3	SEc SW NE 14-7-4 E	4315-4321	22
Magnolia	3	SEc NW NE 19-7-4 E	3746-3842	361
Magnolia	1	SEc NE NW 23-7-4 E	3717-4130	40

Seminole County

Gypsy	3	NEc SW NW 10-8-6 E	4190-4269	625
Magnolia	4	NWc SE NE 10-8-6 E	4151-5303	98
I. T. I. O.	3	NWc SW NW 11-8-6 E	4161-4204	317
Dixie	3	NWc SW SW 28-8-8 E	3855-3980	OWD 50
Texas	5	SWc NE SW 7-5-8 E	2635-2660	700
Magnolia	1	NWc SW NW 17-5-8 E	2663-2702	437
Sunray	4	NWc SW NE 18-5-8 E	2610-2710	310
Sinclair	1	NEc SW 18-5-8 E	2614-2712	750
Roxana	1	NWc SE NE 11-7-6 E	4370-4382	305

Stephens County

Murphy	13	SEc NE NW SW 12-2-8 W	1535-1542	10
Pace et al	1	NWc SW NE 18-2-7 W	1475-1487	45
Magnolia	3	SEc SW NE 13-1-4 W	2726-2919	700
Prairie	1	NWc SW SW 7-2-7 W	1536-1536	167
Pearce-Brown	4	NWc SW SW SE 27-1-8 W	T.D. 1490	Dry
Magnolia	1	NWc SE 23-1-5 W	T.D. 3380	OWD Dry

Tulsa County

Hershal-McGill	1	SEc 24-17-14 E	1805-1814	5
Berry et al	3	NWc NE 3-16-12 E	1918-1959	OWD 10

KANSAS

Butler County

Empire	1	NEc SW NE 22-27-5 E	2700-2741	100

Cowley County

Lewis	1	NEc SW 18-32-6 E	T.D. 3150	Dry
White	1	SWc NE 4-33-4 E	T.D. 3150	Dry
Forrester et al	3	C SE NW 4-33-7 E	T.D. 1155	Dry
Foster-Deal	1	NWc NE NE 4-33-7 E	T.D. 2900	Dry
Lewis-Hollis	1	SWc SE 35-34-3 E	T.D. 2044	Dry
Mission	1	Lot-9, Blk-42, 22-32-4 E	2279-2300	75
Slick et al	1	NWc NE 22-32-4 E	2931-2977	OWD 6½M
Roth-Faurot	2	NWc SE SE 32-33-4 E	1921-1937	2M

Greenwood County

Lassen et al	1	SEc NW 6-25-9 E	2191-2211	100

Lyon County

Empire	1	SEc SW SE 18-21-10 E	T.D. 2396	Dry

Osborn County

Davis et al	1	SWc SE 30-9-15 W	T.D. 3702	Dry

Seward County

Wilson-Moore	3	NEc 3-35-34 W	2695-2745	2¼M

New Field Operations in Oklahoma, Kansas, Panhandle, North, North Central and West Texas, Week Ended June 16, 1928

OKLAHOMA

Carter County

Company	Well No. Farm	Location
Cox-Hamon	3-Varhees	NEc SE NW 23-1-3 W
Magnolia	3-Lewis	SEc NE NW 23-1-3 W
Hall-Briscoe	2-Miller	NWc NE SW 29-1 3 W

Creek County

Devonian	1-Richardson	SEc SW NE SW 21-17-8 E
Waynee	1-Deere	NWc NE 13-18-8 E
Murta et al	1-Clifford	NEc NW 7-19-7 E
Wilcox	5-Kimble et al.	NWc NE NW 18-14-10
Kirdhner et al	1-Drew	C NE SW 8-17-10
Haddock et al	1-Evans	NEc SE SW 16-17-9
Hull	3-Walker	SEc SW SW 21-18-9 OWD
Hayden	3-Futrell	NWc SE SE 1-19-9

Garvin County

Magnolia	1-Tussy	SWc NW SE 31-1-3 W

Grady County

Champlin	1-Kerns	NEc SW 13-4-8 W

Kay County

Carter	1-David.	NEc NW SW 30-25-1 W
Burnham-McGraw	2-Alberty	CNL SE SE 32-29-1 E

Muskogee County

Smith et al	1-Smith	SEc SW SW SE 18-13-19 E
Rout	1-Timberlake	C SW SE SE 11-14-19 E
Howard-Huff	1-Fewel	NEc NW NE 22-14-18 E
Cameron	1-Manuel	CSL NW NW 6-14-17 E
Dodge et al	2-Bumpus	NEc SE NW NE 17-14-16 E
Nixon	1-McDonald	NE SW 29-15-19 E
Philpin et al	1-Anspach	CEL NW SW SW 20-15-19 E
Hogan-Lammers	2-Blk-5	SWc NW NW 36-15-18 E
Metzger Bros	3-Gibson	CEL SE SW 33-15-18 E OWD
Towner-Witt	1-Bucher	SEc NW 23-15-18 E
Hancock et al	1-Grimmett	NEc NW NW SW 10-15-17 E
Buckles et al	8-Barnett	NEc NW SE 8-15-15 E

Okfuskee County

Umburn	3-Simmer	NWc NE SE 11-10-11
Devonian	2-Fier	SEc SW NE 11-10-11
Henry-Avers	4-Buckley	CWL SE SW 12-12-11

Okmulgee County

Lambert	7-King	CNL NE SW 7-13-15 E
Papoose	9-Rainey	CWL NE SW 21-15-14 E
Nourse	2-Rowe	NEc SE NW 20-15-14 E
Spencer	1-Scott	C NW SW 12-15-14 E
Misner	11-Francis	NWc NW 11-15-14 E
Lavery-Farrell	2-Carter	NEc SE SE 10-15-14 E
Roberts	2-Graham	SEc NW NE 22-15-11

Osage County

Home	9	C WL E½ W½ NE 5-20-11
Jones	1	SEc SW NW 25-26-8

Pontotoc County

Homaokla	5-Berry	SWc SE NE 19-5-8 E
Homaokla	12-McCall	NEc NW NE 17-5-8

Pottawatomie County

McCullough et al	2-Bruno	NWc SW NE 25-7-4 E
Gypsy	2-Cherry	NEc NW 25-7-4 E
Blackwell	2-Cherry	NEc 25-7-4 E
Blackwell	1-Cherry	NWc NE 25-7-4 E
Sinclair	1-Coley	SEc 24-7-4 E
Sinclair	2-Blandin	SEc SW 24-7-4 E
Magnolia	1-Wilbran	SWc SE 24-7-4 E
Magnolia	3-Singletary	SEc NW 23-7-4 E
Magnolia	4-Robbins	SEc 15-7-4 E

Seminole County

Sinclair	1-Peter	SEc NW NW 18-5-8 E
Gypsy	3-Peter	SEc NW 18-5-8 E
Anderson-Pritchard	5-Culley	NEc NW SE 18-5-8 E
Anderson-Pritchard	4-Culley	NWc SE 18-5-8 E
Anderson-Pritchard	3-Culley	SWc NE 18-5-8 E
Magnolia	2-Reed	NEc SW NW 17-5-8 E
Shaffer	1-Carolina	SEc SW NE 4-6-7 E
Carter	1-Moore	SEc NE NW 11-7-6 E
Carter	3-Jackson	SWc NW NE 11-7-6 E
McCullough	1-McGilbray	SWc NE 4-8-8 E
Gypsy	1-Barkus	SEc SW SE 6-8-6 E
Gypsy	1-Baby	SWc NE 6-8-6 E
I.T.I.O.	1-Ritenour	SEc SW SW 22-8-5 E
Gypsy	1-Mosar	SEc NE 1-8-5 E
Pure	1-Bryan	NFc 15-9-7 E
Slick	1-James	NWc SE SW 6-9-6 E
Barnsdall	3-Bruner	NFc SE SW 2-9-5 E
Gypsy	10-Sango	NEc SE SE 1-9-5 E

Stephens Counry

Clark-Cowden	1-Watkins	SEc NE SW 22-2-7 W
Muse et al	1-Branch	SWc SE 1-2-8 W

Wagoner County

Carder	1-Atkins	NWc NE SW 25-18-15 E OWD
Mack Drlg	1-Cousin	SEc NW 15-17-15 E

KANSAS

Ellis County

Rush	1-Gatewood	NWc 4-15-20 W

Greenwood County

Empire	14-Schwab	SWc NW SW NE 25-22-12 E
Murphy et al	1-Dorset	SWc SE SE 31-24-9 E
Henderson et al	3-Gaffney	NWc NE SW NE 7-24-11 E
Murphy et al	4-Olson	NWc SE 6-25-9 E
McGinnis et al	1-Finch	NEc SW 11-26-12 E

Stevens County

Sidwell et al	1-Kelly	SEc NW 16-34-38 W

TEXAS
NORTH AND NORTH CENTRAL

Archer County

Company	Well No. Farm	Location	Survey
Perton	1-Peters	Abstract-692	I&GN
Panhandle et al	5-Garvey	Sec-1856	TE&L
Rose	3-Garvey.	Sec-1856	TE&L
Burns	1-Wilson	Sec-1115	ATNCL
Bridwell	1-Wilson	Blk-18	Geraldine
Carter	1-Parkey	Sec-11, Blk-3	H&TC
Jeffers et al	1-Wilson	Sec-10, Blk-3	H&TC
Moran-Golding	1-Jackson	Blk-194, Abst-2,	Aldridge

Brown County

Midland	1-Hickman	Blk-801	McGloin
Kone Prod	11-Hickman	Blk-783	Benson
Kone Prod	4-Hickman	Blk-783	Benson
Kone Prod	3-Hickman	Blk-783	Benson
Sinclair	3-Eubanks	Blk-141	Mitchell
Cranfill-Reynolds	3-Keller	Blk-141	Mitchell
Cranfill-Reynolds	7-Eubanks	Blk-141	Mitchell
Cranfill-Reynolds	6-Eubanks	Blk-141	Mitchell
Clark Buffalo	1-Kessee	.....	Kern
Johnson	1-Meiss	Blk-3	SA&MG
S. W. S.	3-Baugh	Blk-638	Neill
Clark Buffalo	5-Perry	Blk-623	Kenney
Henshaw	16-Bush.	Blk-623	Kenney
S. W. S.	2-Baugh	Blk-638	Neill
Bryson	1-Bull	Blk-624	Honeycutt
Humble	4-Byler	Blk-43	T&NO
Charter	6-Byler	Blk-43	T&NO
Lamb	1-Sweed	Blk-54	Grant
Heatley	1-George	Blk-137	Winn
Heatley	1-Kilgore	Blk-133	Horan

Coleman County

Gwinnush et al	12-Dibrell	Blk-265	Hicks
Roth-Faurot	1-Ferry	Blk-57	Coleman Co. Sch. Land
Apache	1-Gates	Sec-98, Blk-1	GH&H
Texas	1-Smith	Sec-13, Blk-1	GH&H
Midsun	1-Overall	Sec-10, Blk-1	GH&H
Cunningham et al	3-Jennings	Blk-94	Lipscomb
Cunningham et al	2-Jennings	Blk-94	Lipscomb
Derby	5-Jennings	Blk-94	Lipscomb
Derby	3-Jennings	Blk-94	Lipscomb
Barnsdall	1-Aldridge	Blk-665, Sec-7	Scott
Whiteside	1-Stafford	Blk-275	Alderata

Cook County

Green et al	1-Thomas	Abstract-169	BBB&C
Green et al	1-Moore et al.	Abstract-165	BBB&C

Denton County

Elliott-Moore	1-Curtiss	....	Gazoway

Eastland County

Chestnut-Smith	1-Brashears	....	VanNorman
Republic Prod	3-Sneed	Sec-30	McLennon Co. Sch. Land
Price et al	1-Holcomb	....	House

Grayson County

Knotts et al	1-Badgett	....	Farmer

Jones County

Snowden-McSweeney	1-Isom	Sec-50, Blk-18	T&P

Shackleford County

Roeser-Pendleton	64-A60-Cook	Sec-60	ET
Roeser-Pendleton	68A60-Cook	Sec-60	ET
Roeser-Pendleton	70-A60-Cook	Sec-60	ET
Roeser-Pendleton	20C60-Cook	Sec-60	ET
Roeser-Pendleton	4A61-Cook	Sec-61	ET
Roeser-Pendleton	66A60-Cook	Sec-60	ET

Wichita County

Rio Bravo	14-Rio Bravo	Sec-31, Blk-5	H&TC
O'Neal	1-Roberts	Sec-16	E&TB

Wilbarger County

Inter.-Roxana	1-Waggoner	Sec-43, Blk-4	H&TC
Consolidated	3-Waggoner	Sec-5, Blk-5	H&TC
Easter	1-Waggoner	Sec-26, Blk-4	H&TC
Staley-Wynn	1-Waggoner	Sec-32, Blk-4	H&TC
Easter et al	1-Waggoner	Sec-39, Abst-492	MEP&P
Fain-McGaha	5-Waggoner	Sec-24, Blk-4	H&TC
Bars-Dillard	1-Waggoner	Sec-5, Blk-5	H&TC
Baker	1-Waggoner	....	Butler
Burton et al	1-Waggoner	Abstract-1029	Skinner
Texas	1-Waggoner	Sec-5, Blk-5	H&TC
Waggoner Farm	1-Waggoner	Sec-5, Blk-5	H&TC
Waggoner Farm	1-Waggoner	Sec-5, Blk-5	H&TC
Barkley-Meadows	2-Waggoner	....	H&TC
Barkley-Meadows	2-Waggoner	Sec-5, Blk 5	H&TC
Barklev-Meadows	1-Waggoner	Sec-5, Blk-5	H&TC
Fain-McGaha	6-Waggoner	Sec-31, Blk-4	H&TC

Young County

Moutray	3-Booser	....	Garrett
Pennell et al	10-Boone	Abstract-34	BBB&C
Montgomery et al	1-Keen	Sec-3401	TE&L
Lange	1-Robinson	Sec-1466	TE&L
Kerbow et al	1-Lorance	Sec-2731	TE&L
Morrison et al	2-Keen	Abstract-1594	Compere
Atlantic et al	2-Brainard	Sec-1923	TE&L
Atlantic et al	1-Thomas	Sec-1900	TE&L

WEST TEXAS & PANHANDLE

Carson County

Ryan Consolidated	1-Block	SE NW NE Sec-111, Blk-4	I&GN

Cochran County

Clark-Melet	1-Slaughter	CNL, Labor-74 League-118	Knox Co.-Sch. Land

(Continued on Page 61)

New Field Operations in Oklahoma, Kansas, Panhandle, North, North Central and West Texas, Week Ended June 16, 1928

(*Continued from Page 60*)

Glasscock County

Company	Well No. Farm	Location	Survey
Landreath Prod....	2-Houston.	SEc Sec-18, Blk-35	T&P

Gray County

Herrogan.....	1-Lester	SE SW NW Sec-1, Blk-1	ACH&S
Un. Eight Oil Trust.	1-Clay	SE SW SW Sec-177, Blk-B-2	H&GN
Empire.....	2-Bender	SWc SE Sec-164, Blk-3	I&GN
Strause-Allen.....	1-Davidson	SW SE SE Sec-87, Blk-B-2	H&GN
Texas.....	4-Chapman	NEc NW Sec-50, Blk-25	H&GN

Howard County

Cosden.....	3-Roberts	SWc SE Sec-129, Blk-29	W&NW

Irion County

Marley et al.....	1-Lidley	C NW Sec-34, Blk-1	H&TC

Mitchell County

Hucony.....	1-Weichel	C NW NE Sec-78, Blk-26	T&P

Pecos County

Sun.....	1-Univ.	SE NE NE Sec-8, Blk-17	Univ.
Farrell et al.....	1-Univ.	Sec-26, Blk-24	Univ.
California.....	4-Smith	SE NW NW Sec-23, Blk-194	GC&SF
Roxana.....	8-Smith	NE Sec-27, Blk-194	GC&SF
Roxana.....	9-Smith	Sec-27, Blk-194	GC&SF

Reagan County

Company	Well No. Farm	Location	Survey
Big Lake.....	150-Univ.	NE Sec-1, Blk-2	Univ.

Reeves County

Eastland.....	1-Campbell	SWc Sec-43, Blk-59	PSL

Winkler County

Roxana.....	1-Hendricks	SWc SE Sec-39, Blk-26	PSL
Roxana.....	5-Hendricks	CWL E½ NW Sec-45, Blk-26	PSL
Landreath Prod....	3-Hendricks	Sec-40, Blk-26	PSL
Landreath Prod....	4-Grisham et al.	CEL W½ NW Sec-45, Blk-26	PSL
Landreath Prod....	2-Cowden	NE NW NW Sec-3, Blk-B-12	PSL
Humble.....	4-Hendricks	NEc SW Sec-39, Blk-26	PSL
Amerada.....	1-Cowden	NW NE NW Sec-3, Blk-B 12	PSL
Southern Crude....	T-88-M-17-Hendricks	SE SW SE Sec-33, Blk-26	PSL
Southern Crude....	T-88-M-9-Hendricks	SW NE NE Sec-33, Blk-26	PSL
Southern Crude....	T-88-H-5-Hendricks	SE SW SW Sec-28, Blk-B-5	PSL
Southern Crude....	T-672-D-2-Hendricks	SWc Sec-28, Blk-26	PSL

Completions in North Louisiana and Arkansas, Week Ended June 14, 1928

Louisiana—Webster Parish—Spring Hill

Company	Well	Location	Depth	Yield
Magnolia Pet. Co.....	Leona Sexton No. 1	32-23-9	2697	28 mil ft gas

DeSoto Parish—Naborton

Monrovia Co.....	Nabors No. 1	32-13-11E	770	1 mil ft gas

Union Parish

Carter & Goodwin.....	Hudson No. 1	7-23-1E	2275	10 barrels

Morehouse Parish

Southern Carbon Co...	Davis No. 1	21-20-4E	2148	45 mil ft gas

Ouachita Parish

Southern Carbon Co....	Fairbanks No. 9	34-20-4E	2165	8 mil ft gas

Richland Parish

W. C. Feazel.....	Pardue No. 1	32-16-6E	2450	48 mil ft gas
Feazel & Hemlar.....	Pardue et al. No. 1	21-16-6E	2445	51 mil ft gas
S. D. Hunter.....	McCoy B-1	16-16-6E	2440	30 mil ft gas

East Texas—Panola County

S. H. Gardner et al.....	H. L. Brumble No. 1 B. C. Gordon HRS	2308	5 mil ft gas	

South Arkansas—Rainbow City—Union County

E. M. Jones et al	Stegall No. 1	22-17-14	3711	dry abandoned
Ohio Oil Co.....	J. W. Pumphrey No. 2	1-17-14	3247	dry abandoned
Pure Oil Co.....	E. F. Gregory No. 2	11-17-14	3229	800 barrels
Pure Oil Co.....	E. F. Gregory No. 6	11-17-14	3186	3,000 barrels
Rovenger Oil Corpn....	W. H. Perdue No. 1	10-17-14	3246	4,488 barrels
Rushing et al.....	Gregory No. 6	11-17-14	3226	500 barrels

Union County—Lapile

H. L. Hunt.....	Dykes No. 1	21-18-12	3205	salt water abn

Drilling Operations in Oklahoma and Kansas, Week Ended June 16, 1928

	June 16 Week Ended					June 9				
	Loc.	Rigs.	Drg.	S.D.	Total	Loc.	Rigs.	Drg.	S.D.	Total
OKLAHOMA										
Burbank.....	3	7	10	...	20	2	8	8	...	18
Other Osage.....	3	7	19	4	33	2	7	17	5	31
Bristow-Cushing.....	3	2	30	6	41	1	4	35	6	46
North Oklahoma.....	6	4	45	31	86	7	3	48	29	87
South Oklahoma.....	13	8	97	31	149	12	7	91	28	138
Muskogee.....	...	18	42	26	86	...	10	48	19	77
Okmulgee-Bristow...	11	38	71	20	140	12	33	73	24	142
Seminole Dist.....	31	44	163	15	253	24	38	164	15	241
Total Oklahoma.....	70	128	477	133	808	60	110	484	126	780
KANSAS.....	...	82	158	55	295	37	53	159	52	301
GRAND TOTAL....	70	210	635	188	1,103	97	163	643	178	1,081

Plan Orderly Development Of Rainbow Pool

(*Continued from Page 57*)

as of June 15 and June 7.

Following completion of T. B. Slick's No. 1 Hembree in the NE NW SE of 19-7N-5E, Pottawatomie county, Okla., as a 5000-barrel producer in the Wilcox, the Magnolia Petroleum Co. determined to deepen its offsetting Wilcox discovery which had never been much of a well.

At 4094-4101 Magnolia's No. 1 Hembree was producing about 500 barrels a day when the Slick well came in. June 12 it was deepened 13 feet to 4114 and produced 1308 barrels in 24 hours. The same day Slick deepened his well 2½ feet to 4125 feet and was rewarded with a production of 5165 barrels.

June 13 Magnolia drilled ahead 5 more feet to 4119 bringing the well up to 4078 barrels and at the end of the 24-hour period the well was flowing at the rate of 200 barrels an hour. Slick's well meanwhile increased its production to 6095 barrels of 43.8 gravity oil at a temperature of 88 degrees F.

A careful deepening of Magnolia's well 1½ feet June 15 brought production to 5396 barrels. Slick at the same time deepened one foot to 4126 and produced 5175 barrels. In 24 hours ended June 16 the Magnolia well produced 5552 barrels and the Slick well 7075 barrels without further deepening. The temperature of the oil is about 84-85 which is a little high but not excessive.

Current opinion is that the Wilcox pool surrounding these two wells will not cover a large area. A mile east and a quarter mile south of its discovery, Magnolia is drilling No. 1 Fyke in the NW SW SE of 20-7-5 at 4106 in the Sylvan shale. Formations are running about 200 feet lower than in the discovery. The same company's No. 1 Ship She Wano in the SW NE of 19-7-5 is down to 4060 with formations running about 100 feet low. This is a north offset to the producer.

Another well which is running low is Magnolia's No. 2 Harper in the SE NW NE of 19-7-5, four locations north of the Slick well which topped the Viola at 4140 and is still in that formation with a small show of oil at 4284.

Current indications are that the operators' committee will have no difficulty in reaching an agreement to curtail development of this area in line with other wildcats in the greater Seminole district. T. B. Slick is willing to shut his big well in and has had one preliminary meeting in his office at which not enough operators were present to act. Another is to be called soon.

West of Earlsboro in the Mission district the Gypsy Oil Co. opened the week by completing its No. 1 Mission in the SWc of 5-8-6 which started off with a production of 2702 barrels the first 24 hours from Wilcox found at 4327-40. It was pinched in after the first day's production but flowed 1962 barrels through an ⅛-inch bean in 16 hours when the tremendous back pressure which developed killed off the well. It is being equipped to pump and will be produced in accordance with the state corporation commission's order announced June 15 which permits the drilling of nine other wells in the vicinity of this and the Gypsy's No. 1 Dosar a half mile south which has been pinched in for several months.

The nine test wells permitted will test out an area equal to about four

sections when completed about Aug. 15.

E. W. Whitney set up a danger signal to operators in the South Little River field when he got a hole full of water in the Wilcox topped at 4400 feet and drilled to 4406 where it is expected to be plugged. This failure is located in the NE NW NE of 25-7-6, a mile southeast of the Carter Oil Co.'s well in the NWc of 24-7-6. The failure will tend to slow down operations to the southeast although it does not finally condemn the area since salt water wells in the Wilcox have been offset by big producers in other parts of the Seminole area.

Among the 85 wells which are expected to be drilled in south Little River between now and Aug. 15 only two locations have been made so far within a mile of the Whitney failure and both of these are well over toward successful tests.

A new east extension to the Burbank field at the south end of the field has been proven by the Lewis Prod. Co., A. G. Oliphant and the Empire Oil & Refining Co. in the NEc of 22-26-6, Osage county. The Burbank sand was found at 2936-83 as reported a week ago. After a shot of 160 quarts the well produced 735 barrels in 12 hours. The location is a full mile east of production and is thought to be similar to the east extension found in the vicinity of Shidler.

Winkler County Gaged At 1,063,083 Bbls.

Staff Special—By Telegraph

HOUSTON, June 18.—Short time gages for prorating purposes give the Winkler county, west Texas, oil producing territory potential production daily of 1,063,083 barrels from 209 wells on 105 acreage units.

It is pointed out, however, that these figures represent only a yardstick for measuring production allotments and would not be sustained were the Winkler wells flowing wide open with reservoir pressures distributed.

New proration percentages for the last half of the month were put in effect June 16, and based on allowable production of 175,000 barrels daily. This compared with 150,000 barrels maximum previously.

Actual production June 15 was 143,368 barrels from 206 wells. Wells on the same acreage units could not produce crude quantities allotted them under the combined potential production and proved acreage yardstick used for prorating.

Engineering Congress Set for 1929

NEW YORK, June 18.—A World Engineering Congress will be held in Tokio, Japan, in October, 1929, according to Maurice Holland, executive secretary of the American committee. Engineering societies throughout the world plan to be represented.

Deep Sand at Santa Fe Springs Feared at This Time

Staff Special

LOS ANGELES, June 16

SANTA FE SPRINGS is the big question mark in California today, due to the drilling of one deep test and the persistent reports that other deep tests are starting. Many oil men largely believe there is a deeper oil sand underlying the Myer zone, and at this time there is actual fear that this sand will be uncovered at a time when new production is not wanted in the state, except by the lone operator who might benefit.

Wilshire Oil Co. is drilling a deep test in the congested part of the field, and although no accurate information is given out, it is known that the hole has a depth of about 5900 feet. Cores are taken frequently, but these cores are carefully guarded and brought to the Wilshire office in Los Angeles before being examined. Reports given considerable weight indicate that these cores are showing both oil and gas.

Wilshire this week was rigging up at Peterson No. 1 and Bandini No. 7 preparatory to either working over or drilling deeper. George F. Getty rigged up his No. 17 well and is pulling the oil string, probably to drill deeper.

The Texas Co. recently abandoned three old producers at Santa Fe Springs and has filed notice of intention of drilling one old producer deeper or working it over. During the last three weeks notice of intention to either drill deeper or work over nine old producers in this field have been filed.

Scouts working the field are of the opinion that several of these wells will be drilled deeper. Those working over and preparing to drill holes deeper include Lockhart & York, Union, General Petroleum, Shell Co., George F. Getty, Wilshire, and Bandini Petroleum Co. One scout this week predicted that within 90 days at least 20 wells would be drilling in this old field.

Santa Fe Springs reached its production peak in 1923 and activity was noticeable by its absence the last two years. The big production came from the Myer zone ranging from 4300 to 4700 feet, most of the holes taking in about 400 feet of oil bearing formation. The wells in this field have shown the slowest decline of any field in the state, especially in Los Angeles Basin.

At Long Beach, eight completions were reported the last week, furnishing 11,000 barrels of flush production. Six of the wells were new holes and made a total of better than 8000 barrels, while two recompletions furnished 3000 barrels of new oil.

The completion of these new wells pushed total daily average of the field past the 200,000 mark, and there is still a chance that the peak will reach 225,000 barrels, if not more. At least a dozen wells are due for completion in the next seven days, and it is possible for more than this number to be brought in.

Miley's deep test at Rincon was drilled to about 4985 feet, swabbed for production test and made some oil, but refused to flow. When bailer was run it was found the casing had collapsed. It is now being worked over. Eighty-five feet of perforated pipe was placed at bottom, and cores looked promising. It is now thought that the field must depend upon deeper oil zones for production as 16 wells now producing from the upper zone were making slightly more than 2500 barrels, combined.

Activity at other fields of the state was without incident.

Exercise Your Franchise, Urges Harrington

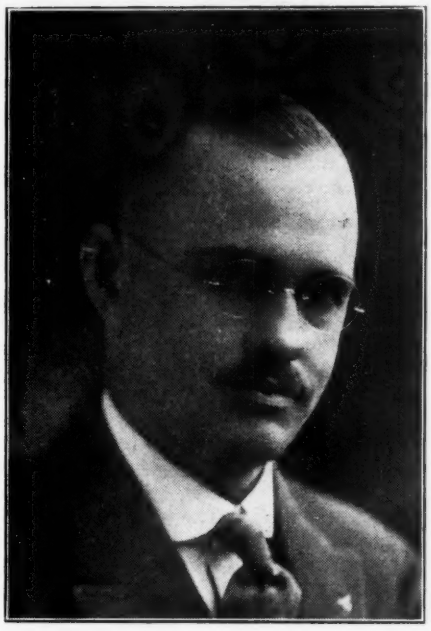
CHICAGO, June 18.—Members of Independent Oil Men of America seem to want to bring their wives to Chicago to a big convention with exhibits and a banquet this fall. They want to leave home Sunday and spend Monday, Tuesday and Wednesday in the city. But, by and large, they don't just care so much about terpsichore.

Lou Harrington, manager of the association, has been conducting a mail (male) ballot. He asked all his members six questions and has been tabulating results. The questions had to do with moot matters regarding industrial gatherings, to wit, where, when, what to do for fun and must the wife tag along.

All the votes are not in. The members have the rest of June in which to decide on what they want in the way of convention. Some of them did not have any opinions at all on some of the subjects and remained discreetly non-committal on them. But the vote up to now is as follows:

The question "Where?" is answered Chicago by 16, St. Louis by 10 and Columbus by two—Mr. Harrington does not say whether they mean Columbus, O., Columbus, Ga., or Columbus, Ind.

The decision on the early part of the week as an ideal time is emphatic. Nineteen prefer Monday, Tuesday and



FRANK E. SPENCER

President of the Spencer Petroleum Co., Chicago

Spencer Petroleum Co. Enjoys Outing

CHICAGO, June 19.—The office of Spencer Petroleum Co., Chicago, remained closed all day June 19. The company's annual outing took place on that date at Medinah Country Club. A few friends besides the officials and employes of the company were in the party.

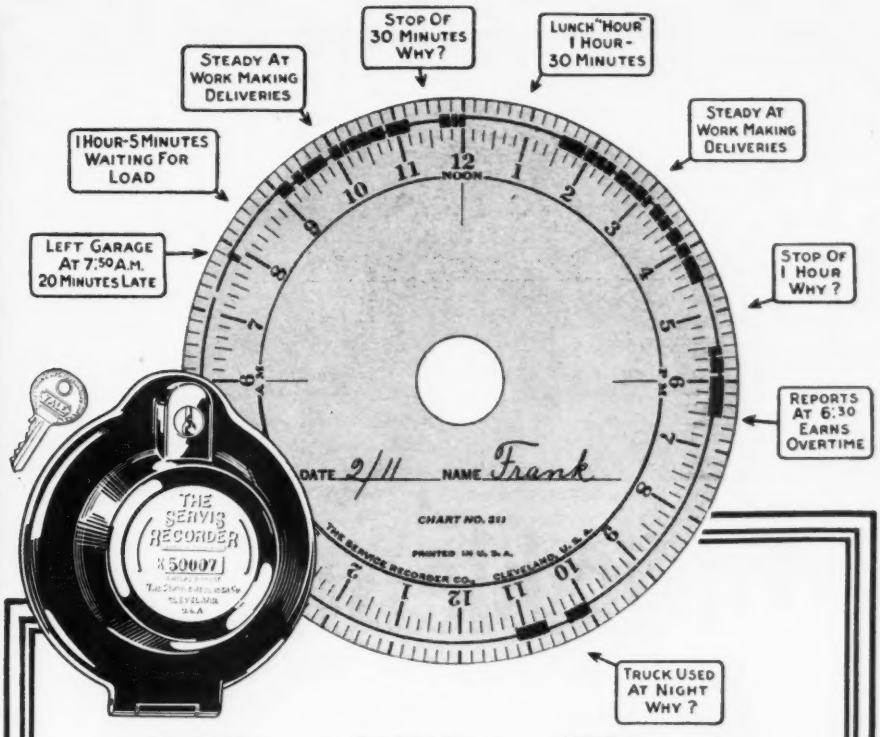
Activities of the day consisted largely of golf. Participants in the game were advised to tee off between 9 and 9:30 a.m. or 2 and 2:30 p.m. The celebration continued into the evening. Dinner was served the whole party at 8:30 o'clock. The rest of the evening was spent dancing.

Wednesday and nine want Tuesday, Wednesday and Thursday. One wants the last three days of the week.

Two dozen voting members want exhibits as against five who do not. Sixteen want a big social banquet while 12 want to go over to King Hung Lo's and eat egg subgum in a private compartment.

Sixteen of the members want their wives invited to Chicago at the same time. But six of them admit that taking a wife to Chicago is like taking a ham sandwich to the lord mayor's banquet.

The vote on dancing is 13 to 13, tenth inning, two down, three balls and two strikes.


STOP OF 30 MINUTES WHY?
LUNCH "HOUR" 1 HOUR-30 MINUTES
STEADY AT WORK MAKING DELIVERIES
STEADY AT WORK MAKING DELIVERIES
1 HOUR-5 MINUTES WAITING FOR LOAD
LEFT GARAGE AT 7:50 A.M. 20 MINUTES LATE
STOP OF 1 HOUR WHY?
REPORTS AT 6:30 EARNS OVERTIME
TRUCK USED AT NIGHT WHY?
DATE 2/11
NAME Frank
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A Buckeye excavating ditch for 8-inch line from loading rack at Pyote to Winkler County field, Texas. Contractors, Henry & Holland.

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The pipe-line Buckeye *is not* just another ditcher. It is not even the same Buckeye that is in high favor for light sewer and water trenching. Instead, it is a ditcher which is constructed especially for profitable oil-field performance.

Built to the specifications of the oil world's leading engineers and contractors, the latest Buckeye Pipe-Line Ditcher has such valuable exclusive features as these: Practically *all-transmission* control; power steering; multiplied digging speeds—18" to 19' per minute; 2 digging wheel speeds; Alligator traction brakes, permitting operation on steep grades; and heavy duty industrial motor. Many others.

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Development Methods In West Texas

(*Continued from Page* 48)

oil-ratios, make the Chalk field and the Chalk sand production a particularly interesting study.

Methods of Increasing Production:
(See Figs. 13, 14 and 15)

Shooting has been the principal method of increasing production. All Chalk sand wells are shot except those in which the sand is unconsolidated. Shots vary in size from 10 to 60 quarts of solidified or liquid nitroglycerine. The best results have been obtained by using a 3½ inch shell of sufficient length to cover the sand to be shot, and loading the hole with 200 feet of oil. The Jack Squibb is usually used to explode the shot. Increases in production of as much as 400 per cent have been noted.

Cleaning out operations are necessary for the maintenance of high operating efficiency and production. A cheap method of cleaning out is now being used by one operator in the field. This is a combination oil gas circulation method. A mixture of oil and gas is injected between the tubing and casing and allowed to pass down to a special shoe on the end of the tubing. The tubing is gradually lowered into the cavings.

The mixture of oil and gas picks up the cavings, and carries them to the surface through the tubing. The cavings are dropped out in a settling ditch and the oil recirculated. This method has decreased the cost of clean out 65 per cent and has made it possible to shoot, clean out and have a well back on production in four days.

Repressuring has been practiced on one 80 acre lease for a period of six months. Wet gas is returned to the sand through an in-put well in the center of the lease. Efforts have been directed toward the maintenance of pressure rather than the increase of production, because this lease is entirely surrounded by property controlled by another operator. The Chalk sand is well suited for repressuring and unit operation of a repressuring plant would be advantageous to all operators in the field.

The air or gas lift has not been used, although a number of wells in the Settles sand, 2,500 foot horizon and Roberts horizon are well suited for this method of production.

Gas-Oil Ratio:

The natural gas-oil ratio from the Chalk sand ranges from 60 to 20,000 cubic feet per barrel, with an average of 550 cubic feet. Considerable work has been done on the control of gas-oil ratios in pumping wells. It has been found that the ratio is more satisfactorily controlled in certain wells by holding back pressure at the casing head, instead of increasing the pumping fluid level.

Guide to Study for Ambitious Refinery Workers

By H. T. Bennett*

AMBITIOUS refinery workers frequently are at a loss as to how they may obtain information regarding refinery operations and facts about the products they help to manufacture daily. Few know of the vast amount of information available which may be obtained at comparatively small cost.

Any intelligent refinery operator can increase his fund of knowledge in three ways (1) by observation of methods used in the refinery where he is employed; (2) by asking intelligent questions and (3) by reading.

If an average of half an hour, after working hours each day, were spent in observing refinery operations and equipment, and another half hour in reading, a vast amount of knowledge could be obtained in a period of five years. After observing and reading for a short period, the worker would acquire sufficient information regarding certain methods of refining to ask experts in certain phases of refinery operations intelligent questions.

A busy light oil treater may be glad to inform a fellow employe it requires six pounds of 66 degree Be sulfuric acid per barrel to treat a certain brand of kerosene, but the same treater would not be very responsive if the questioner simply asked, "How do you refine oil?"

By observing, reading and asking different workers in the light oil department intelligent questions, a pressure still operator may know more about treating gasoline and kerosene than a less ambitious man in the light oil department who mechanically follows his foreman's instructions without ever trying to study the reason for doing the work outlined.

As one of the principal advantages of a college training is the knowledge gained as to where to find information on any subject, many men who have not had the opportunity to obtain this training never realize the large amount of information that is available on practically any subject. It is for such men this article is written.

During the past five years a great deal has been published regarding the manufacture and use of petroleum products. One of the most complete and valuable publications on petroleum is the "Handbook of the Petroleum Industry," by David T. Day, Volumes I and II, published by John Wiley & Sons. Every phase of the petroleum industry is covered and each phase is written by an authority on the subject.

IN THE present period of new developments in refining methods, the ambitious worker in the plant is often at a loss where to turn for knowledge that will not only keep him posted on changes in refining practice, but also allow him to progress into a better job for himself.

The accompanying article is written by a man in the industry for such individuals.

NATIONAL PETROLEUM NEWS itself sells most of the books which are referred to in this article. In addition its book department is glad at all times to give readers in any branch of the business a list of books on any desired subjects and to secure for them books and pamphlets on any phases of the oil industry.

Volume I describes the occurrence of petroleum, field methods in petroleum geology, oil field development and petroleum production, statistics on petroleum and natural gas production, transportation of petroleum products, characteristics of petroleum, methods of testing petroleum, natural gasoline, asphalt and oil shale.

Volume II describes refining and cracking processes, use of fuel oil, internal combustion engines, lubrication, pipe standards and use of pipe.

MANY valuable technical papers and bulletins are published by the U. S. Bureau of Mines and Bureau of Standards. These publications may be obtained free, until free editions are exhausted, by writing to the director of the department issuing publications desired. When free copies are exhausted any paper may be obtained by writing to the Superintendent of Documents, Government Printing Office, Washington. The price of all papers is very low, usually 5 to 25 cents. The government bureaus publish at intervals circulars describing their recent publications and, if requested, will send you a card listing new publications.

Detailed information of various patented processes can be obtained by sending a dime for the patent desired to The Commissioner of Patents, Washington, D. C. When requesting a patent give title, patent number, date issued and patentee. A description of many patented processes, especially methods of cracking oils and treating gasoline may be found in "Gasoline and Other Motor Fuels," by Ellis-Meigs, published by D. Van Nostrand.

THE following Bureau of Standards publications contain valuable information:

"Pyrometric Practice," by P. D. Foote, C. O. Fairchild and T. R. Harrison, Technical Paper 170, price 60 cents. This paper gives description of instruments used for measuring temperatures.

"National Standard Petroleum Oil Tables," Circular 154, 30 cents. This circular contains tables showing gravity and weight per gallon, reduction of observed gravity to 60 degrees F., volume at 60 degrees F., occupied by unit volume at indicated temperature.

Much general information regarding production, refining and marketing of petroleum, brief summaries of recent patents and information necessary for obtaining same may be found in oil trade journals such as the NATIONAL PETROLEUM NEWS.

More detailed information may be found in books limited to certain phases of petroleum. "Industrial Oil Engineering," by Battle, published by J. B. Lippincott, covers rather completely lubricants and lubricating problems. Other publications on lubricating oils are: "American Lubricants," by Lockhart, published by the Chemical Publishing Co., and "Practice of Lubrication," by Thomsen, published by McGraw-Hill Book Co. In the above publications the methods of testing lubricants, explanation of laws of friction, description of lubricating appliance and machinery requiring lubrication, and recommendations of grade of lubricant to use under different conditions are given.

Valuable information as to the use, method of testing and manufacture of greases may be found in "Lubricating Greases," by Klemgard, published by the Chemical Catalog Co. Methods of manufacturing, transporting and testing natural gasoline may be found in "The Recovery of Gasoline from Natural Gas," by Burrell,

*Chief chemist, Mid-Continent Petroleum Corp., Tulsa.

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published by Chemical Catalog, Inc. and in "Natural Gasoline," by G. G. Oberfell and R. C. Alden, published by authors.

Properties of gases and means of transporting and measuring are described in "Handbook of Natural Gas," by Wescott, published by Metric Metal Works.

Asphalt and allied products are described in "Asphalts and Allied Substances," by Abraham, published by D. Van Nostrand.

Methods of testing road oil and asphalt may be obtained in U. S. Department of Agriculture Bulletin No. 1216, "Tentative Standard Methods of Sampling and Testing Highway Materials."

As millions of dollars worth of equipment must be replaced yearly, due to corrosion, a knowledge of the action of chemicals found in petroleum and used in refining should be of value. The information in the two following books should greatly add to one's knowledge of corrosion and methods of prevention.

"Chemical Resistance of Engineering Materials," Hamlin and Turner, published by the Chemical Catalog Co.

"Corrosion Tests of Materials of Construction for Chemical Engineering Apparatus," Calcott, Whetzel, Whittaker, published by D. Van Nostrand Co.

As the various constituents of petroleum are separated by distillation, filtration, compression and refrigeration, a knowledge of the principles of the above operations should aid the refinery worker in understanding what is taking place at each stage of refining a barrel of oil. Information on the above mentioned subjects may be found in:

"Elements of Fractional Distillation," Robinson, published by McGraw-Hill Book Co.

"Industrial Filtration," Wright, published by Chemical Catalog Co.

"Practical Refrigeration," Powers, published by McGraw-Hill Book Co.

"Compressed Air," Simons, published by McGraw-Hill Book Co.

"Motor Fuels, Their Production and Technology," Eugene H. Leslie, pub-

SOME of the Bureau of Mines publications giving information regarding the different phases of the manufacture and use of petroleum products are:

"Methods of Decreasing Evaporation Losses of Petroleum," by J. H. Wiggins, Bulletin 319, price 15 cents.

"Extraction of Gasoline from Natural Gas-Absorption Methods," by G. A. Burrell, P. M. Biddison and G. G. Oberfell, Bulletin 120, 10 cents.

"The Diesel Engine; its Fuel and Uses," by Herbert Hass, Bulletin 156, 25 cents.

"Bibliography of Petroleum and Allied Substances, 1921," Bulletin 220.

"Bibliography of Petroleum and Allied Substances," Bulletin 285.

"Efficiency in the Use of Oil Fuel," by J. M. Wadsworth, 15 cents.

"Extinguishing and Preventing Oil and Gas Fires," by C. P. Bowie, 20 cents.

"Fuller's Earth," by C. L. Parsons.

"Oil-Storage Tanks and Reservoirs," by C. P. Bowie, 25 cents.

"Design and Operation of a Low Pressure Absorption Plant," by W. P. Dykema and A. A. Chenoweth, 10 cents.

"Removal of the Lighter Hydrocarbons from Petroleum by Continuous Distillation with especial reference to Plants in California," by J. M. Wadsworth, 50 cents.

"Gas Masks for Gasoline and Petroleum Vapors," by S. H. Katz and J. J. Bloomfield, 15 cents.

"Properties of Typical Oils from Eastern Producing Fields of the United States," Serial 2202.

"Properties of Typical Crude Oils from the Producing Fields of the Rocky Mountain District," Serial 2235.

"Analyses of Crude Oils from Seminole District, Oklahoma," Serial 2824.

"Physical and Chemical Properties of the Petroleum of California," Technical Paper 74.

"Inflammability of Mixtures of Gasoline Vapor and Air," Technical Paper 115.

"Engine Service Tests of Internal Combustion Engine Lubricating Oils made from California Crude Petroleum," Technical Paper 387.

"U. S. Government Master Specifications for Lubricants and Liquid Fuels and Methods for Sampling and Testing," Technical Paper 323B, 15 cents.

adopt the most efficient method of converting his crude oil into dollars, i.e. Dubbs Cracking Process with Flashing System, will get his returns out of the small end of the horn

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POPULAR OIL GEOLOGY by Victor Ziegler, is a non-technical book for the layman interested in geology from a practical standpoint. As shown by the following table of contents, it will give him information on—

The Rise and Development of the Petroleum Industry. The Composition and Properties of Oil and Gas. The Origin of Oil and Gas. Rocks and Their Properties. Stratigraphic Geology. The Arrangements and Structures of Rocks. The Reservoirs of Oil and Gas. The Laws of Migration and Accumulation of Oil and Gas. Maps and Their Uses. Oil Structures and Oil Fields. Popular Fallacies in Oil Geology. Prospecting and Developing Oil Lands. Oil Shales and Their Utilization. Oil Investments.

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THE addresses of publishers mentioned in Mr. Bennett's article:

John Wiley & Sons, Inc., 440 Fourth Ave., New York.

McGraw-Hill Book Co., 370 Seventh Ave., New York.

D. Van Nostrand Co., 8 Warren St., New York.

J. B. Lippincott Co., Washington Square, Philadelphia.

The Chemical Publishing Co., Easton, Pa.

The Chemical Catalog Co., 19 East Twenty-fourth St., New York.

Metric Metal Works, Erie, Pa.

Bureau of Mines Bulletins and Papers (free copies) Director of Bureau of Mines, Washington, D. C.

Bureau of Standards Papers (free) Director of Bureau of Standards, Washington, D. C.

Any of Bureau of Mines or Bureau of Standards publications Superintendent of Documents, Government Printing Office, Washington, D. C.

lished by Chemical Catalog Co.

Methods of refining are continually changing and consequently some of the data given in the books suggested are now out of date. It is for this reason necessary to read the trade and scientific journals in order that one may keep in touch with the latest developments.

Trade journals and books containing interesting data may be found in public libraries. At the beginning it is well to subscribe to one trade journal and purchase a book relating to the subject of greatest interest. Later other books should be purchased. A good library on petroleum should be of value to any worker who intends to stay in the oil business.

Following the suggestions made may not result in an immediate promotion, or increase in salary, but it should prepare an ambitious worker for advancement when the opportunity arrives or, better still, prepare one so that he can go after the opportunity.

LOS ANGELES, June 15.—Hans Ross of Baash-Ross Tool Co., recently left Los Angeles for the East. He will continue on to Denmark where he expects to pass several months, returning to California about Oct. 1.

Seven Flow Beans Used to Handle Output of California Gasser

Staff Special
LOS ANGELES, June 15

SEVEN flow beans in addition to chains and clamps and a number of other valves are all required to handle and distribute the output of the big gasses at California Eastern Oil Co.'s Horowitz 1 in the Alamitos Heights area of Seal Beach.

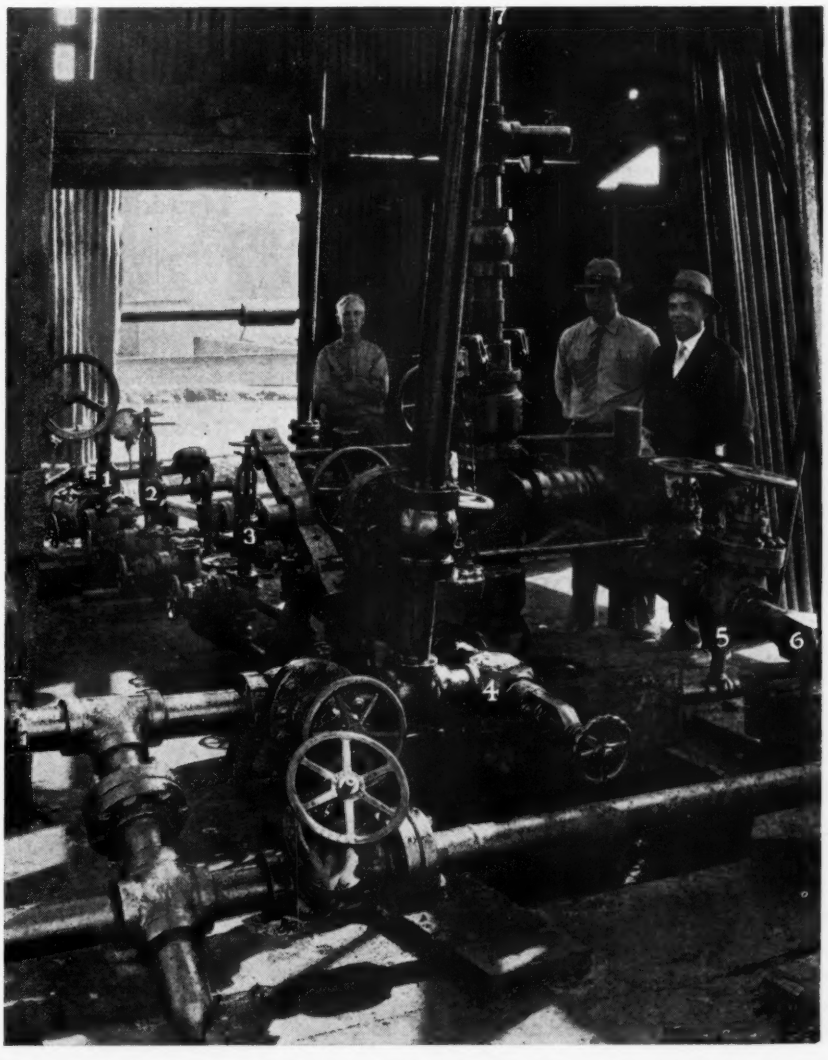
This well blew in early in May and estimates of its gas production the first day ran from 20,000,000 to 30,000,000 cubic feet with no oil. May 21 it was making 10,000,000 cubic feet of gas, 7,000,000 of which was going through the traps with the remainder being used to flow two wells, and for other purposes. A small portion of the production is blowing into the air. It is now making approximately 130 barrels of oil.

When the well was completed, the gas pressure was 1700 pounds, while the needle on the tubing hit the peg, indicating a pressure slightly exceeding 2000 pounds.

These high pressures indicated the need of extra strong fittings and in the accompanying photograph two sprocket chains will be noted, one on each side of the main casing running into the hole, anchored in the cellar.

The casing pressure is being held to around 1200 pounds now and Shaffer beans are being used to hold the pressure at this point.

The beans in the photograph are numbered from 1 to 7. No. 1 is a 2-inch and is fitted on the pipe leading to California Eastern's Ostroff 1. No. 2 of the same size regulates the gas flow to Judson 1. These two wells are on the gas lift. Bean No. 3 is also a 2-inch and is used as a bleed. Bean No. 4 is a 3-inch and regulates the gas flow to trap No. 1 while No. 6 is a 2-inch and leads to trap No. 2. No. 5 bean is also a 2-



Showing the large number of fittings including two gate valves and seven Shaffer beans at California Eastern's Horowitz No. 1, a big gasser at Alamitos Heights, California

PROFIT
What Is It?

Does it mean merely buying oil at one price and selling it at another? Supplying those who patronize you because they happen to, or because they think you are a fine fellow?

Profit is one of the most interesting and intriguing words in the English language, and to capitalize it you must sell not only yourself and your service, but some real, understandable reasons why the oil you handle gives the best service.

Jobbers handling Humble Oils know all of the reasons why people should buy their oils instead of other brands. They *believe* in these reasons themselves, many of them having been developed through experience. Consequently, their businesses are outstanding and profitable.

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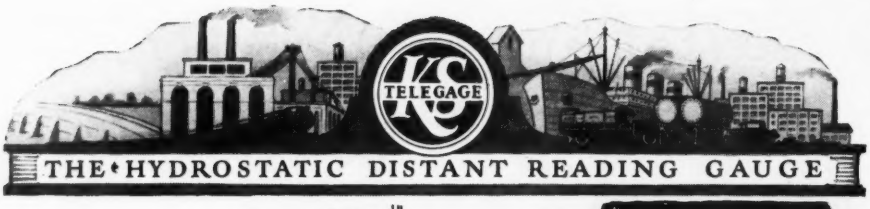

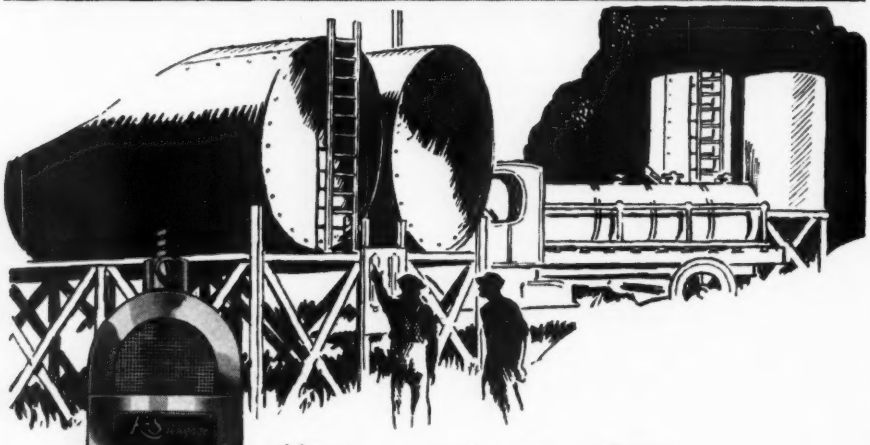

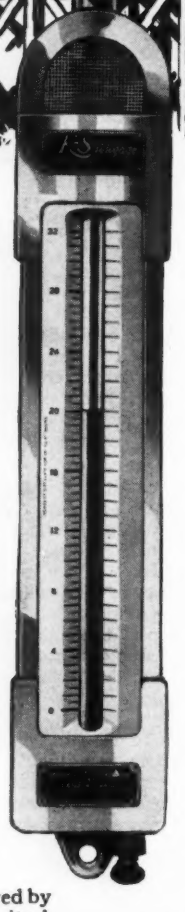

"Liquid Cash"

—*guard those storage tanks as carefully as money!*

Untold thousands of dollars, in the form of petroleum products, are stored in refineries or at distributing points! Too often this valuable material is handled casually, even carelessly.

Refiners and distributors have grown more and more dissatisfied with the old-fashioned "measuring stick" and tape—for the contents of their tanks actually represent *so much cash in the till.*

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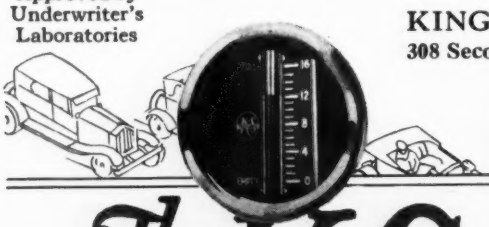

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inch and is the second bleed outlet. No. 7 bean at the top of the picture is a 4-inch for emergency use. Since the picture was taken No. 7 has been removed.

A close inspection of the picture shows that two gate valves were used as a double precaution, as the well came near getting away from the drillers the first day or so.

There are probably more beans used on this well than on any other well in California. The Shaffer bean was first used successfully on Ventura Avenue wells where the gas pressure has always been exceedingly high. Where wells are making considerable gas under heavy pressure, the Shaffer bean can be regulated at will by a simple turn of a small wheel, either increasing or decreasing the orifice.

The Horowitz well was originally drilled to 5503 feet and later plugged back to 5460 feet. The 4½-inch oil string was cut at 3600 feet and the water string was perforated at a point thought to be around 4500 feet. Officials of the company are withholding information as to what they consider the depth from which the gas is coming. The gas is thought to be coming from the top of the Bixby zone or slightly above it.

Those in the picture reading left to right are Charles Busbee, pumper; Henry Lewis, production superintendent for California Eastern, and H. B. Moore, field representative of Shaffer Tool Works.

Warning Issued Against 'Gyp' Retreaded Tires

CLEVELAND, June 16.—Warning has been issued by the National Better Business Bureau, Inc., New York, to tire dealers, including gasoline and oil stations, and motorists against the buying of "gyp" retreaded tires which are being made in New York, Pittsburgh, Springfield, Mass., Rochester and Chicago. Retreading of badly worn and often dangerous treads threatens to spread to other cities, the bureau says in a current bulletin.

Treads like those used by the large and reputable tire manufacturers have been put on carcasses of any make that are bought of junk and second hand tire dealers. Rubber reclaimed from old tires, garden hose and other articles is used in retreading with only enough virgin rubber to serve as binder, the bureau says its investigators have ascertained.

Prices are low to attract the dealer who is looking for a long profit.

LOS ANGELES, June 16.—Sam Marshall, geologist of George F. Getty, Inc., has resigned to enter business for himself. He is succeeded by Dave Wallace, formerly connected with Miley Oil Co.

Loading Products in Boat or Tank Car Offers Chances to Cut Costs

By D. F. Gerstenberger

RETAIL and wholesale shipment of oil, may be divided into three main methods, namely, bulk shipment by boat and barge, bulk shipment by tank car, and shipment in barrel and package.

This article will deal with the first two methods and point out what has been considered good practice for efficient shipment, both to the satisfaction of the customer and the shipper.

Shipment by tanker or barge must be handled with great care. Such carrying equipment is costly and its cost as a carrying medium is reduced only as it is used efficiently. When I say it is costly, I refer to the actual sum invested. The actual cost of shipping by water is of course much less per unit than the cost of shipment by tank car, when properly handled.

The order in which the tanks on board a barge or vessel are to be loaded should be understood by both the loading man and the boat's mate or captain. They should be properly gauged before and after loading. Before any loading starts the boiler fires should be extinguished where possible and the ship furnished with steam from land boilers provided for that purpose. Loading should not proceed until orders are given by the mate or captain, to start.

If the switching of tanks is taken care of properly the loading may be continuous, thereby speeding it up considerably. This is especially true of heavy oils where sometimes it requires an hour or more to bring the loading rate up to its maximum, due to line friction and a viscous product.

When one tank is nearly full, the oil is opened into the next one sufficiently so that when the former is shut off there will be an outlet. Best results are sometimes obtained by loading into two or three of the ship's tanks at once. This is true when the loading line is considerably larger than the loading connections. For instance, a 16-inch loading line allows the use of three 6-inch loading connections at one time.

After the loading is complete, samples should be taken in a manner to satisfy the customer or the captain, but regardless, the refinery or shipper should take a sample from each individual tank for his own protection. The ship's captain should sign for the amount of oil received which should be checked, both by the loading tank gauges and the ship tank gauges.

The handling of the vessel can be speeded up considerably if the necessary provisions are made for clearing before it comes into the harbor. A great many of the larger companies, find it advantageous to have a man who does nothing but handle these details stationed at the points of loading, and he is usually known as the marine superintendent.

He can usually arrange to meet the vessel a mile or two outside of the port, and can have everything in readiness for clearing when the boat steams into the harbor. He can also handle and arrange for such items as pay-rolls, provisions, and repairs when necessary. Such items assure the maximum service factor of such a vessel. A good man so employed proves to be a good investment.

Probably the most common method in use today for transporting oil is by tank car. Many plants receive their crude by tank car although the time is fast approaching where it is almost impossible to run crude so received at a profit. Consequently, plants are being built all over the country which may be served by pipe-line, and the particular products desired for that locality are taken from the crude, and in instances, the remaining residue is in turn pumped to the seaboard plant for further processing, or for direct shipment.

PRACTICALLY every refinery, however, must deal with tank car shipment of products and consequently, we will outline in a general way, a method of handling which proved to be efficient, and reasonable to a plant situated where practically every bar-

Gasoline loading rack at Mid-Continent Petroleum Co. refinery, West Tulsa

an Unbeatable Oil Pump at an Unbeatable Price!

This illustration shows the new No. 5 Wizard Pump, with the removable measure rest lowered ready for use.

This illustration shows the removable measure rest in raised position.

The WIZARD Sensation for $2.95

The No. 5 Wizard is a one quart pump of the non-visible type with a combination 1½ inch and 2 inch screw base and a telescopic intake pipe to fit 15 to 55 gallon barrels.

The nozzle is positively non-drip and is equipped with a bottle filling tube as well as a locking and sealing device.

Notice that no drain is provided and no oil can be returned or added to the original contents of the barrel, a special feature of the new No. 5 Wizard.

Finished in high grade baked enamel which is oil-and-water-proof. We can furnish any trade colors if specified; otherwise finish will be in our standard color of green.

The National Steel Barrel Co.

3860 East 91st St. **Cleveland, Ohio**

Branch Offices in Principal Cities

OIL, GREASE, ALCOHOL AND KEROSENE EQUIPMENT

rel of its production was shipped by this method.

To begin with, proper loading equipment is necessary. A pump-house set aside specifically for this purpose, and situated in such a way as to be convenient, both to the loading rack and the loading tanks is desirable. It should be fitted with pumps of ample capacity to load cars as rapidly as is reasonable, according to the daily quantity to be loaded. The opinion of the writer is that any refinery should be able to load at least one tank car per hour, and in most instances, one every 20 minutes or oftener. The advantage of the latter will be brought out directly.

The loading tanks should be of ample size to allow a fairly large shipment, up to as much as a train load, to be loaded from the same tank. This tends to insure uniform shipments. Suction lines of ample size should be provided so that the loading pump may operate at its capacity.

The writer has seen loading facilities limited by this very feature. Each pump should be provided with a pressure governor or relief valve, the former preferred, so that the loading rack man may at any time shut down against the pump without injury to the loading lines or the pump.

LOADING connections at the rack should be provided with quick opening and closing valves, of which there are many on the market which have proven satisfactory, and they should also be constructed with double swing joints to allow for ease in handling and to minimize repair. So much for generalities of equipment.

Visualize with me, if you will for a few minutes, a method of loading gasoline in a certain refinery, which can be adapted to any other product. The loading tank of 5000-barrel capacity contained gasoline ready for shipment. The laboratory had tested a top and bottom sample, and likewise an average sample and approved it for shipment. It was necessary after the first test to circulate the gasoline in the tank, for we found that that in the bottom was not quite up to specifications, whereas the oil in the top was considerably better than the specifications required.

We circulated by taking suction from the bottom, and discharging into the top through a swing pipe which was set so as to be just below the surface of the oil. We found that after about an hour's circulating in this way that the tank was uniform throughout.

While we were doing this, the cars were placed at the rack, after having been inspected by a competent man to insure that there were no repairs needed and that the valves were in good working order. The boot caps are left off the cars, and the foot valves are raised and seated to in-

They Continue to Buy and Use

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HERCULES DELIVERY CANS

THE FLANGED TOP
CAN
THAT MAKES POURING
EASY

**Note the Handle on Top—
Easy to Lift and Carry!**

5 and 10 GAL. Capacity

BUILT TO WEAR!

Our factory output has increased yearly to the point that we are now shipping Hercules Delivery Cans to Distributors over the entire country. Increased demand for these cans is evidence that Hercules Cans fill every needed requirement.

Hercules Delivery Cans are made to withstand the abuse given a container of this nature and we have equipped them with 4½ in. Malleable iron handle screw plugs fitted into heavy steel necks providing one additional handle for convenience of handling.

Each Hercules has two hollow steel handles Acetylene Welded to the breast, cannot come loose.

Hercules Delivery Cans

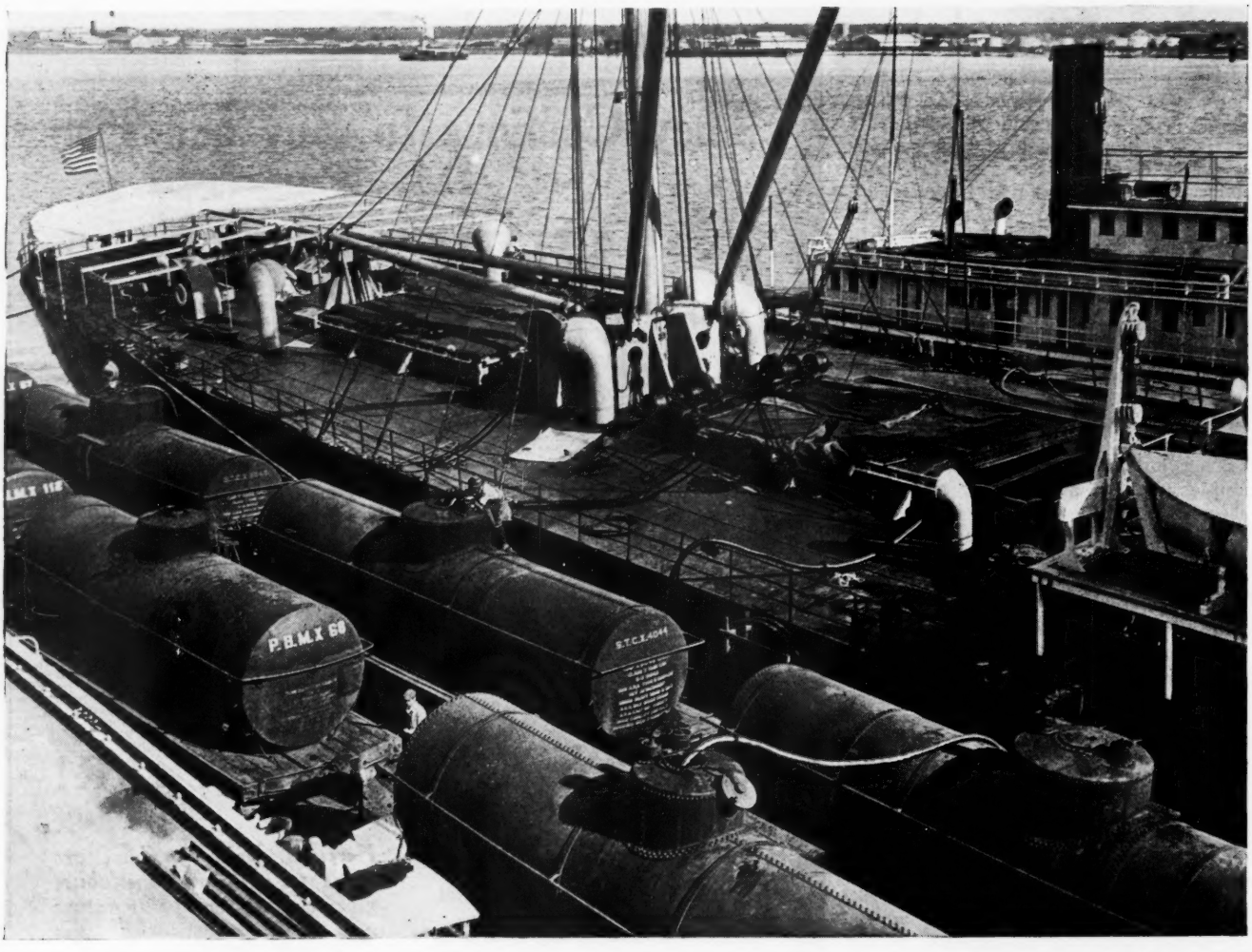
**Winning and Holding New Friends
— and Old —**

The most gratifying knowledge that can come to a manufacturer is to know that his steady and lasting increase is due entirely to his product meeting all requirements as to material and workmanship as well as his fair price. New customers as well as old are repeatedly ordering Hercules Delivery Cans, wholly because of these virtues. Ever-increasing demands of the Oil trade find us every ready to serve them.

**Order from Your Distributor
or
the Manufacturer**

METAL BARREL CORP.

PEORIA, ILLINOIS



By Ewing Galloway, N. Y.

New Orleans water front shipping scene, ocean steamer bunkering fuel oil direct from tank cars

sure that they are seated properly.

The numbers of the cars which have been in our service are noted, and by reference, we insure ourselves that they have been used for nothing other than gasoline for the previous shipment.

For further precaution, we examine them to see that they are perfectly clean and do not contain any oil remaining from the last shipment which might be off color, or off specification. If there is any, such cars are properly drained, and if necessary, wiped out to prevent contamination.

As soon as the cars are ready, we open into one and loading pump is started. We watch the foot valve carefully to be sure that it doesn't leak, and in about five minutes, we open into the second, and in another five minutes we open into the third. This gives us three cars to watch at the same time, but of course we will have to shut them off in rotation, in the same order as we started in to load.

It is better to shut them off a little below the dome, than to let any oil get into the dome, for gasoline cannot be loaded into the dome under any circumstances. We can if necessary go back and slowly fill them to the proper level, if they are not quite full. This procedure is repeated until all the cars to be loaded are full, after which it is necessary to help out the man who is taking samples, putting on boot caps and dome covers, and sealing and applying the necessary labels.

Of course, if our loading rack is small, and we must load more cars in the same day, there are enough men available so that these things can be taken care of as fast as we load, and so that the switch engine can remove these cars from the rack, almost as soon as we finish loading the last car.

WE FIND it advisable to sample the cars from the footvalve as well as from the top. The bottom sample insures us that there is no water present, while we use the average sample drawn from the top to properly test the product before it is shipped, thus checking the results obtained in testing the loading tank. Where all the cars are to be shipped to the same point and buyer, we can make up a composite sample of all the top samples, and approve shipment on one test instead of so many.

However, we wish to have our products shipped from the plant meet the standard we have set for them, and consequently we will not ship a car of gasoline, before it has been tested according to the set methods.

Where shipments are rushed, and each car is an individual shipment, the laboratory can be testing samples of the first cars loaded while we are loading the others.

The boot caps are applied with satisfactory gaskets to prevent leakage and the dome covers are screwed down tight also and both are sealed. The seals are properly noted. Inflammable labels are applied in a manner to meet interstate laws, and the car numbers with capacity, and gauge, and seal numbers, after being properly noted, are turned into the shipping department, where they are computed and the total quantity checked with the amount loaded from the shipping tank.

The loading man responsible for the operation as a whole, signs his name to these tickets to show that he has noted each car and knows that it was properly loaded. This is our protection as well as that of the buyer that he is receiving the amount of oil he is billed for and it is our protec-

tion also in the event any loss occurs in transit.

Due to the fact that we can load the cars rapidly, we can accomplish all this loading in the day time, thereby eliminating many handicaps which are bound to be attendant on night loading. Of course, if we were required to load the 5000 barrels in one day, we would have to operate two loading pumps at one time, and we would load on both sides of the rack at the same time, loading six cars at a time instead of three.

You will notice that we have a sign placed at the inbound end of the loading rack, which cautions locomotives not to switch cars in on the rack while we are loading. This furnishes precaution against damage and loss while loading, as well as providing precautions against a possible fire hazard. The switch engine operator must at all times cut his fires, before switching on any of the tracks adjacent to the racks or within 100 feet of the racks. This naturally is a fire protection measure also.

Whenever possible we card the cars for shipment while at the rack for in this way the rack foreman is not taken away from the loading rack at any time, and can consequently supervise the loading efficiently.

Only the regular switching crew is allowed to handle the coupling of the cars prior to their removal from the rack for they are schooled in their work, and know how to do it safely. The cars are now ready for shipment, and we can feel satisfied that they are loaded and shipped in a manner which insures that the product will reach its destination in a way that will satisfy the buyer, and make him a booster of our products.

Railway Filling Station Invades the South

NASHVILLE, Tenn., June 15.—The combination bulk and filling station with a railroad location and tank car storage has come to Nashville. The first one has just been established by a Birmingham, Ala., corporation called the Southern Stores Co., operating in several southern cities. The new oil station is cutting the price 3 cents.

The plant is in East Nashville, a medium residential section. It is selling what the management calls Dixie Vim. The local manager is I. M. Green.

The *Nashville Tennesseean* donated four inches of news space to announce the opening of the 18-cent gasoline vending establishment. Mr. Green explained that the discount was made possible by a "one price profit system."

The posted tank wagon price in Nashville is 19 cents, including a 3-cent state tax.

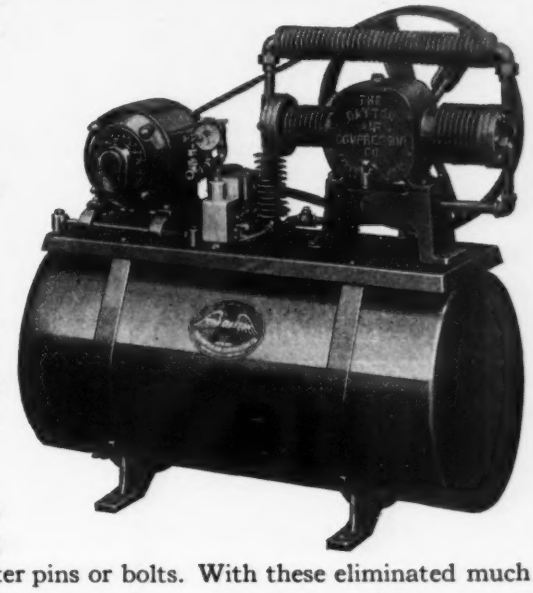
TURNING "AIR" INTO DOLLARS

A filling station cannot "keep house" today without an Air Compressor. The modern station has its grease rack, its engine cleaning and, in many cases, an air gas dispensing system, in addition to the job of tire inflation—all calling for compressed air.

A COMPRESSOR IS AN ABSOLUTE NECESSITY

And It Is Not Wholly A "Free Service" Now.

It is a profit maker; your air is turned into dollars when it operates a hoist and does many of the engine and car cleaning jobs which are now a feature of the progressive station's business. Get the right compressor for the job—not too large, not too small.



Here is the "DAYTON" G-8

An all purpose compressor with a 2 H.P. Motor and a capacity of 9¼ cub. ft. per min.

And—that's not all.

This compressor is built without connecting rods, crosshead pins, cotter pins or bolts. With these eliminated much trouble is eliminated. Fewer repairs are necessary on this two-stage wonder.

DAYTON AIR COMPRESSORS

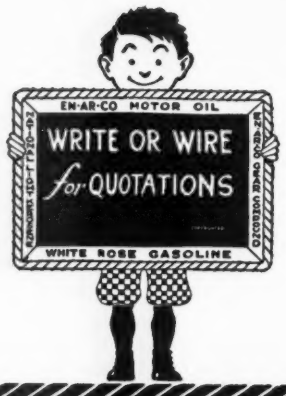
425 Valley St. **Dayton, Ohio**

Gasoline And Other Motor Fuels

by Ellis and Meigs, is a book which gives a complete survey of the field and a description of practically every process of making gasoline and most other motor fuels of promise or prominence.

The price of the book is $10. Just send us your check and we will mail a copy of it to you.

National Petroleum News, 1213 W. Third St., Cleveland, Ohio



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YOU will make money if you handle these nationally advertised brands.

All grades of lubricating oils and greases.

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CHIEF ENGINEER

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by an Engineering and Contracting concern specializing on design and construction of complete Oil Refineries and component units.

Must have training, experience and executive ability to direct large organization. Applicant required to furnish complete detail information regarding past experiences, references, etc.

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The Mathematics of Price-Cutting

How much more gasoline and oil must be sold, on a cut price, to turn in the same profit? A five per cent price cut requires 25 per cent increase in turnover to keep the profit even—these are the figures of the Tide Water Oil Sales Corp. published in Contract, a house organ. The article, giving the mathematics of cut price follows:

SOME retailers in every line of business cut prices to increase sales. This is true of oil and gasoline dealers and the purpose of this article is to show by cold-blooded figures a true picture of the conditions resulting from price-cutting from the standpoint of the dealer's profit.

A dealer cuts prices for one of two reasons: Either as an advertising expediency or in the mistaken idea that price-cutting will increase his profit.

When the dealer cuts prices to secure greater profit it is a sure sign that he has no idea of how much more business he must do to just break even. He doesn't know, for instance, that a 5 per cent cut in price requires a 25 per cent increase in turnover even to keep his profit where it was before he cut his price.

A statement of percentages like that may sound like "the bunk" to the average dealer. If so, it is time for him to bring out the old arithmetic book and follow through a simple and surprising mathematical process like the one that follows:

Your dealer makes money if he sells Veedol or anything else he handles for a sum larger than your price plus his expense of doing business. If he knows his business, he first decides upon the margin of profit that he wants to make. Then he arrives at his proper selling price by adding that percentage to the cost of the merchandising plus his expenses.

If the dealer reduces his selling price, he reduces his percentage of profit, of course. But this reduction affects more than his profit. It affects his turnover, which is what the average dealer does not understand. He does know that when he cuts prices he must obtain greater sales volume on the cut-price article, and he expects to gain it by cutting the price. If he understood *how much more* volume he must obtain in order to do a paying business, he would think twice before cutting.

Let us translate this into figures and see what happens. For simplicity, let us take $1,000 worth of merchandise. Suppose that by figuring out the dealer's expenses and the amount that he is willing to accept as a fair return on his investment, he finds that sum to be $333, or 33 1/3 per cent on his investment.

The fundamental figures concerning this business are:

Amount of investment	$1,000
Selling price	1,333
Total amount of profit	333
Per cent of profit on cost	33.3
Per cent of profit on sales	25.0

If, later, he decides upon a "small" price cut of 5 per cent in order to help along business, his troubles begin. In the first place, if he sells 5 per cent cheaper, he gives away much more than 5 per cent of his profit. He actually *loses* 20 *per cent profit.*

If he could reduce his investment or his expenses by 5 per cent of the selling price, he would be all right. But he must take that sum out of his *profit.* Here's how it works.

Before the cut, one turnover of the merchandise yielded him 25 per cent on the sales price, or a profit of $333. Now he sells 5 per cent cheaper, or $66.65 below the former sales price. This cut his total profit to $266.35.

A 5 per cent cut in the sales price reduces his profit on selling price from 25 per cent to 21 per cent—a drop of 4 percentage points, or a reduction of 16 per cent of his profit on sales. It lowers his rate of profit on cost from 33 1/3 per cent to 26.6 per cent—a drop of 6.7 percentage points, or a reduction of 20.2 per cent of his profit on cost.

Now, how does this affect his turnover? Must he do 5 per cent more to make up for that 5 per cent reduction in price, or must he do 20 per cent more to make up for that 20 per cent reduction in profit on cost? Neither. He must do 25 per cent more in volume just to keep his profit where it was before.

One stock turn at a 5 per cent price cut yields only $266.65 instead of $333. But this is just another way of saying that one stock turn is now only 75 per cent as profitable as it was before he cut the price by 5 per cent.

He may make more sales, due to the reduced price, but if he doesn't do more than a quarter again as much he's actually losing money.

LOS ANGELES, June 14.—The Western Oil & Refining Co. of California recently acquired a half interest in several pieces of Signal Hill property from the Olympic Refining Co., a subsidiary of the Dollar Steamship Line, at a reported cost of about $500,000. The property consists of five wells making about 1000 barrels daily.

Burden Bearers of the safari

SHIMMERING Heat Waves — the Sun a Scorching Ball of Fire — Burning Paths of Hard-Packed, Seering Sands — Bursting Lungs sucking in a pittance of Humid Air —

10 Miles — or 300?

To the African Safari on the "trek" 10 miles is a day's hard journey. Over American highways, the autoist considers it a poor day that does not find him, at night-fall, 300 miles or more from the morning's starting point.

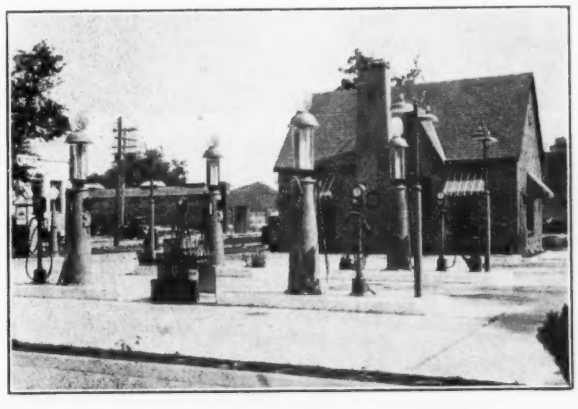
This means at least one stop—in most cases two—for the replenishment of the gas tank. Your average motorist is an impatient chap, and delays at filling stations are not welcomed. He demands SPEED—and the station that gets him on his way again in the shortest possible time is the one that gets his business.

Speed in Delivery

Gasoline pumps are not bought today on "sales talk." They are bought on Performance—and that alone. For many years, Clear Vision has centered its efforts on building a line of pumps that would meet the demand for Speed in Delivery, and combine with that a ruggedness and simplicity of mechanical principle insuring longevity, with freedom from defects and repairs.

Today, the models comprising the 200 Series Clear Vision are without a doubt the "Rolls-Royce" of the pump industry. Model for model, they will deliver more gallonage *per minute* than any pump made. Their increasing popularity—the fact that they are overwhelmingly the choice of shrewd buyers for the finest of the newer stations, is proof of their leadership.

Write or wire us today for further details of these pumps, with specifications and prices.



The new Phillips Petroleum Company Station on East Central Avenue, Wichita, Kansas, is equipped with 4 — 200 series Clear Vision pumps. On the two opening days, this Station broke a world's record for gallonage, selling 3 — 8,000 gallon tank cars of gas. Under this tremendous load, the Clear Vision Pumps performed with 100% perfection.

The Clear Vision Pump Company

WICHITA, KANSAS

Pacific Coast Factory: 1165 W. Ocean Ave., Long Beach, Calif., Phone 668-345
Tulsa Branch: 821 E. First Place, Phone 4-5009
Kansas City Branch: 1313 McGee St., Phone Victor 2606

Original
"GREASE-PAK"
TRADE MARK REG. U.S. PAT. OFFICE

Model 25, the most convenient truly portable 25 lb. capacity greasing outfit obtainable. Pumps ½ lb. grease per stroke. Has durable heavy malleable cast base, strong steel shell 16-gauge top—all seams flanged upward for waterproofness. Metal sleeves protect hose connections against breakage—hose 4½' of ¾" flexible metal with cast nozzle.

Write for
"GREASE-PAK" *Bulletins*
To Muskegon.

Bennett Export Corporation,
32 Broadway, New York City

"Symbol of Quality"

Bennett Pumps Corporation
QUALITY BUILT
BENNETT
Dispensing Equipment
Muskegon, Michigan.

Wash Day for Oil Companies—Rags, Pumps, Tanks, Etc.

TULSA, June 14

WASH day in the oil industry arrives at no stated time, but is becoming more and more a continuous period. The cleansing of equipment and paraphernalia, ranging from 80,000-barrel tanks to wipe rags in refineries and gasoline plants is systematically practiced by many companies.

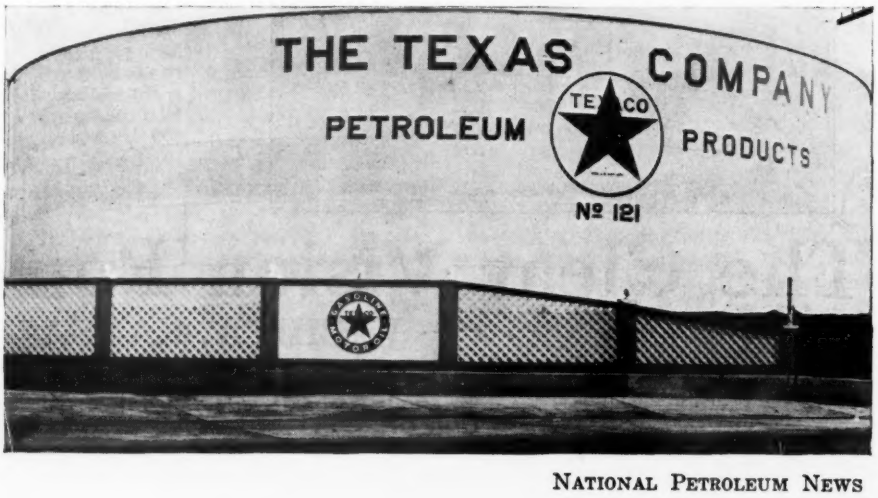
"The words 'industrial cleaning,' as applied to the old industry, cover a very broad field, from the cleaning of salvage parts, such as valves, nipples, etc., to tank steamers that are going from crude to gasoline," said A. J. Ospring, Mid-Continent representative of Oakite Products, Inc., in a recent address before the Tulsa Purchasing Agents Association. In the talk, which was illustrated, he told of the wide range of uses of Oakite in reclamation work.

The cleaning process for nearly all kinds of equipment is simple. For example, Mid-Continent Petroleum Corp. uses a vat at its West Tulsa refinery for equipment as large as a duplex pump weighing 6000 pounds. The vat is 10 feet long, eight feet wide and nine feet deep, buried in the ground, with a drain at the bottom and a drain at the solution level. Muck and dirt that settle to the bottom of the vat are cleaned out when about two feet deep.

Vats used in this method of cleaning are equipped with steam coils for heating the solution. Small parts, such as bolts and nuts, are cleaned by lowering in a wire basket. Only a few minutes are required. For larger parts that are very dirty, such as acid sludge valves, from 30 minutes to one hour is required.

Mr. Ospring explained there are a number of kinds or grades of Oakite. One kind is used for cleaning and stripping paint off tank cars preparatory to repainting. One method of applying is to flow the solution on the cars, using an old oil drum set on the dome of the tank car and heating the solution with a steam hose.

One 55,000-barrel crude oil storage



Views of 55,000-barrel tank before and after cleaning

GOODALL

BRUTALLY STRONG

Yet Unmatched in Flexibility

GOODALL Semi-Metallic Rotary Hose is meeting with notable success because it has the rugged strength necessary to stand up under hard usage—yet is the most *flexible* metal hose on the market.

Its heavy steel armor withstands the highest pumping pressures and gives positive protection against outside wear and damage. The inner tube of highest grade rubber defies the abrasive action of sand-laden slush. The "ball joints" allow free flexing without interfering with internal clearance. Drillers find that the BOSS DUPLEX COUPLINGS "stay put".

We also recommend G. S. M. extra heavy Combination Cementing and Rotary Hose, Manifold Hose, and Steam and Water Hose.

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CONTINENTAL

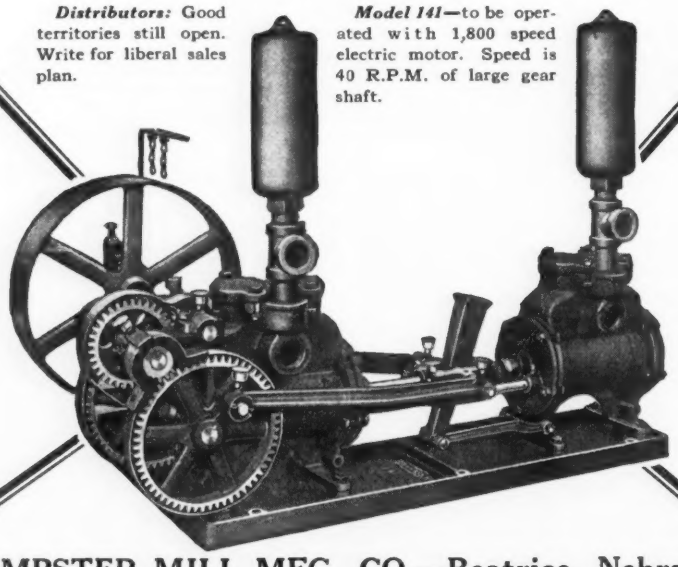
DEMPSTER
OIL PUMP

Here's a pump you can install and forget! Day in and day out, year after year, it will continue to give you trouble-free expense-free service. Gives you all the advantages of two pumps opposing each other on one solid base. A double acting plunger type with Tobin Bronze piston rods, machine cut gears, specially treated packing rings and interchangeable parts. Either pump can be operated separately. Operation of both pumps assure double capacity.

Write for Full Information on this and other Dempster Oil Pumps that are backed by the Dempster 50-year reputation for dependable manufacture.

Distributors: Good territories still open. Write for liberal sales plan.

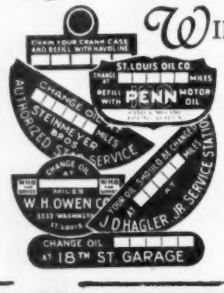
Model 141—to be operated with 1,800 speed electric motor. Speed is 40 R.P.M. of large gear shaft.



DEMPSTER MILL MFG. CO.—Beatrice, Nebraska

Branches: Kansas City, Mo., Omaha, Nebr., Oklahoma City, Okla., Sioux Falls, S. D., Denver, Colo., Amarillo, Texas

CHANGE OIL STICKERS



WIN good will and build big repeat business for quality oil. Every service station should use them. We create individual designs and supply stickers in any quantity from 1000 to 1,000,000 or more. For a nominal charge, distributors can furnish their retailers with stickers bearing imprint of retailer's name and address.

Write for quotation and samples.

ST. LOUIS STICKER COMPANY

1633 Washington Ave. . . . . St. Louis Mo.

tank at the Tulsa refinery of The Texas Co. recently was cleaned and repainted with aluminum paint. It required about eight days for two men to do the cleaning. In a number of cases oil companies have found it good practice when moving large tanks from one field to another to clean and repaint them.

Thus, the work the oil industry is doing in cleaning equipment is widely varied. One practice, which seems to be trivial at first glance, is the practice adopted by several refining and natural gasoline companies of cleaning rags. Rags used for wiping off grease and dirt around a plant cost from 12 to 14 cents a pound. Usually they are thrown away after being used, burned or given to a junk man. The Mid-Continent Petroleum Corp. washes them, using soap and Oakite in a revolving washing drum. The washing is done at a fraction of the cost of the new rags.

The cleaning of valves and fittings has been of considerable profit in the producing industry as well as in the refining. When a piece of equipment is thoroughly clean it is easy to detect any cracks and often an unserviceable valve that would have been sent out for use will be repaired or retired from service, saving much in time and in loss of oil.

Tydeman to Head New Roxana Department

ST. LOUIS, June 15.—The Roxana Petroleum Corp. has established a new department to be known as the Manufacturing department which will act as an advisor in refinery operations. Dr. F. W. L. Tydeman will be made head of the new department on June 15.

R. B. High, superintendent of the Arkansas City refinery, will be moved to Wood River and become superintendent of that plant, succeeding Dr. Tydeman. P. E. Foster, who has been assistant superintendent of the Wood River plant is to be made superintendent of the Arkansas City plant.

S. O. Ohio Has Personnel Chief

CLEVELAND, June 16.—A. A. Stambaugh who was associated with W. T. Holliday, the new president of the Standard Oil Co. of Ohio, in the law firm of Holliday, Grossman & McAfee, has been appointed director of personnel and public relations of the Standard. This is a new position.

Gasoline Plant Enlarged

TULSA, June 15.—The Jackson Engineering & Equipment Co. is enlarging and rebuilding the Rio Grande Oil Company's gasoline plant at Santa Fe Springs. The enlarged plant will have a capacity of about 30,000 gallons per day. It will be ready for operation about Aug. 1.

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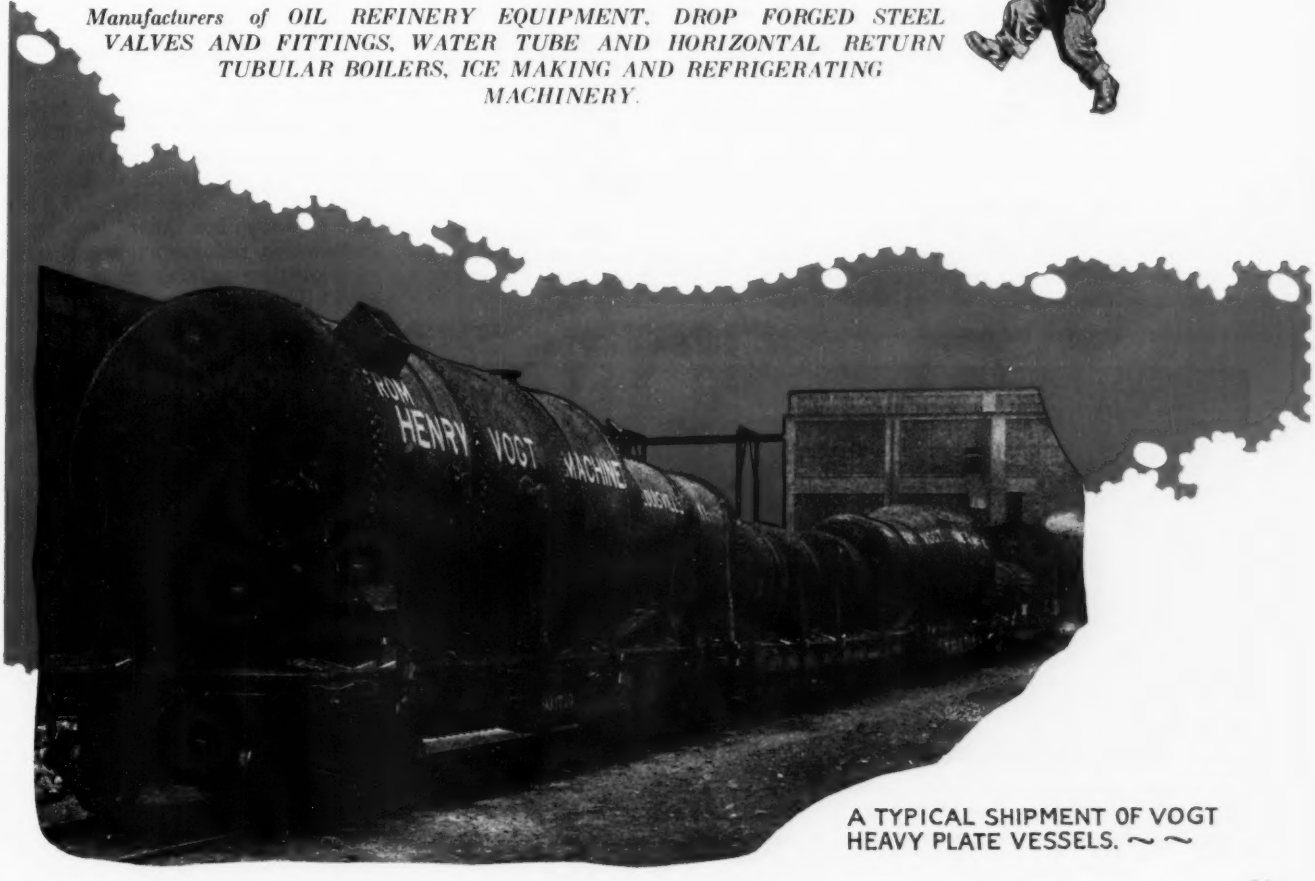

A TYPICAL SHIPMENT OF VOGT HEAVY PLATE VESSELS. ~ ~

Reduction of Losses in Refining Offers Big Field for Increasing Profits

By L. D. Mann*

Read before Technical Division, Western Petroleum Refiners Association, Shreveport, June 4-5

DURING the past few years, the valuation of losses in the oil industry has been given considerable attention. This is probably due to the fact that the value of the refined products has decreased in a greater proportion than the cost of the crude and consequently losses become a decided factor in the successful operation of a refinery.

It has been conservatively estimated that the yearly loss of oil between the well and shipment as a finished product, amounts to approximately 7.5 per cent of the crude oil. Of course, this cannot all be attributed to the refinery but includes the losses due to weathering, transportation and the settling out of b.s. in the crude tanks. We are principally interested in losses at the refinery proper.

To show the magnitude of these, I have prepared a summary of losses at an average 7,000-barrel refinery including the losses due to cracking and lube oil operations.

Crude run	Refinery loss		Cracking loss			Total loss	
barrels	Bbls.	Per cent	Bb's. Chg.	Bbls. loss	Per cent	Bbls.	Per cent
2,529,000	98,600	3.9	797,000 31.5% of crude	77,400	9.7	176,000	6.9

The losses in a refinery may be divided into two classes: visible and invisible. Visible losses would include such items as can be determined readily and usually are a source of much concern as to their disposal. They however, are the smaller of the two and include such items as b.s. in the crude oil, b.s. accumulations in the tanks, carbon sludge in cracking still bottoms and sludge from chemical treating operations, together with miscellaneous leaks and spills around the plant. All of these losses are very apparent and usually receive considerable attention; as, for instance, the accumulation of b.s. and sludges interferes with operations to such an extent that they are removed intermittently.

THE invisible losses, or those due to evaporation, account for approximately two-thirds of the total and as a rule, they do not receive the attention that is warranted. These losses are ever present from the time the crude enters the plant until the finished products are shipped. Crude oil in good, steel top tanks will lose approximately ½ per cent per month through the summer months and this loss is lightest and most valuable part of the crude.

Every effort should be made to reduce the handling loss of crude within the refinery and to keep working storage at a minimum and in as few tanks as possible. Dead storage is required to insure continuous operation and tanks should have vapor tight roofs and be carried full or under constant pressure control.

The losses due to b.s. in the crude oil cannot be controlled very readily. Some of this material drops out in the crude stills and the balance is concentrated and carried out in the residuum where it undergoes a further settling action and usually builds up in the tanks until it becomes a nuisance and is removed. The only control of this situation is a careful checking of crude tanks and the insistence that the pipeline companies deliver crude with low b.s. content.

Losses due to chemical treatment are varied and may be controlled to a certain extent. The sludges from cylinder stock and lubricating oil treating may be reclaimed and burned. Many refiners take advantage of this possibility and have reduced their losses slightly by including such material in the fuel oil yield.

THE evaporation losses during the treating are more difficult to control and many refiners have accepted the continuous treater to replace the old blower type. There is no question but that this type of installation reduces evaporation losses.

A continuous treater is difficult to control and in some cases, refiners have gone to the batch agitator with a circulating pump. This obviates the necessity of blowing with air and the gasoline is mixed with the chemical in a mixer head and then is circulated from the bottom to the top of the agitator. This method is giving good results and is finding considerable favor with many refiners.

Distillation losses on the stills are mostly due to evaporation. All crudes contain a small amount of fixed gas and air in solution. This fixed gas naturally is liberated along with the lighter gasoline fractions and consequently leaves the tail house and rundown lines saturated with the light gasoline.

Lookboxes, rundown lines and tank inlets should be so designed as to be vapor tight and liquids should enter tanks below the surface of the liquid and in such a way as to produce the

*Empire Oil & Refining Co.

Crew Levick Co. employes at planting of tree in honor of Henry L. Doherty at the Crew Levick refinery on Petty's Island, near Philadelphia. Man at left in foreground is C. E. Foster, general manager of the Crew Levick Co., a Cities Service subsidiary. To the right, with head bared, is E. J. Hasse, and just to the left of the tree is E. M. Keely Jr., general superintendent of Petty Island. It was Mr. Doherty's 58th birthday anniversay

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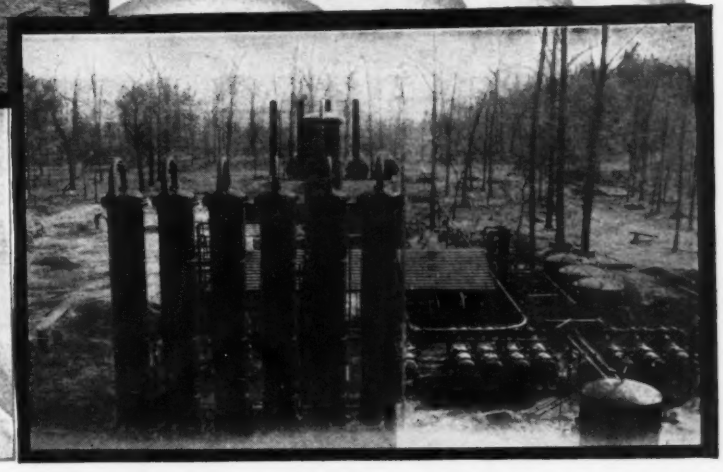

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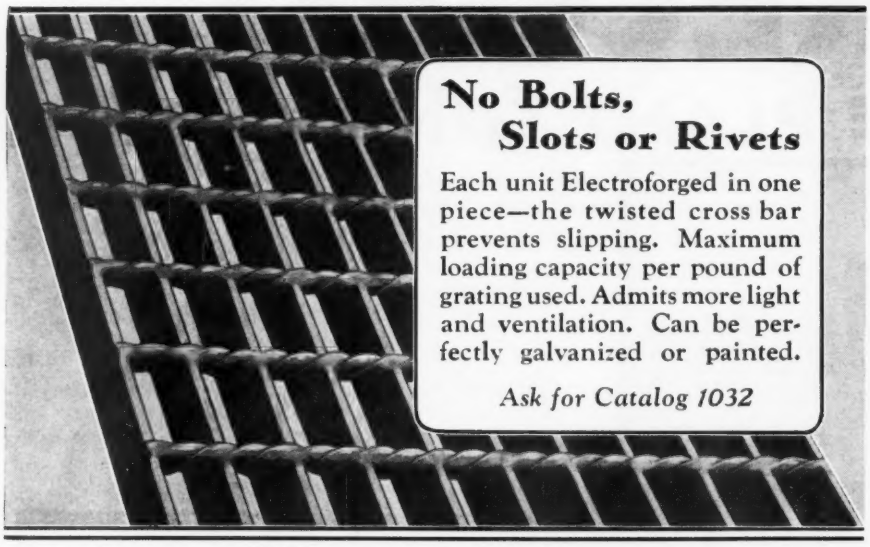

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minimum amount of agitation. Liberation of sulfur compounds from crudes also has its effect on increasing losses not only by the amount of liberated hydrogen sulfide but in addition, the gasoline is carried out due to the partial pressure effect of the hydrogen sulfide and other gases formed.

The trend of the refining industry today is to produce many grades of gasoline and particularly lower end point gasolines. This necessitates the division of gasoline from the crude stills into three of four cuts. When this is done, the vapor pressures of the lighter cuts increase and consequently the evaporation losses are greater in handling these products. Whenever possible, these lighter cuts should be washed and blended with the heavier cuts before going to the rundown tanks.

This is particularly true of the gasolines made from flash towers as they are seldom sold without blending.

Cooling water pumped over condensers cannot be given too much attention and every possible effort should be made to have properly designed condensers and a supply of cold water over the gasoline boxes. If sufficient cold water is not available for all streams, the coldest water should be used on the lighter streams and then passed to the condensers on the heavier oils. Naturally, condenser design and sizes should be such as to bring the temperature of the products within a few degrees of the cooling water supply.

As previously mentioned, evaporation is continually going on within our tankage, the rate of evaporation depending upon the vapor pressure of the liquid in the tank and the temperature of the atmosphere above the liquid. Temperature and pressure changes of the liquid or atmosphere increase the final evaporation losses.

If liquid is transferred from one tank to another, air is drawn into the first tank to displace the liquid while air is expelled from the second tank. The air leaving the second tank is usually saturated with vapors which can be only partially recovered. In the usual refining operations, many transfers from tank to tank are necessary. Usually they are about as follows:

From crude tank to charging tanks
Charging tanks to stills
Stills to rundown tanks
Rundown tanks to agitators
Agitators to current storage
Current storage to tank cars or dead storage.

With each transfer some loss appears and some refiners are employing a so-called traffic manager to route oils through their plants with the least possible pumping. Transfer losses can be reduced further by grouping tanks and having interconnecting vapor lines so that the air expelled from the tank being filled will pass to the tank being emptied. In this way, no fresh air would be al-

lowed to enter any tank. Naturally, an installation of this kind would require adequate pressure and vacuum valves.

You are all familiar with evaporation losses in storage tanks which is caused by changes in temperature of the atmosphere and the oil in the tank. Such changes cause breathing. In the day time, the temperature in the tank rises, which not only expands the atmosphere above the liquid but also heats the surface and raises the vapor pressure. The combination of the two raises the pressure in the tank to a point where the vent valves open and the air vapor mixture is expelled.

At night, the temperature falls and air is drawn into the tank through the vacuum valves. Barometric changes also affect the tank in the same way but these changes are not as severe as the effect of the temperature. To reduce evaporation caused by breathing, all tanks should be made vapor tight and equipped with safety and vacuum valves of sufficient size to handle the maximum temperature changes.

It is true that much difficulty has been encountered with such valves due to corrosion; however, many installations have been made in the past few years which are being operated successfully and several satisfactory valves are on the market for this purpose. Many of you are familiar with the various types of roofs, such as the use of reflecting paints, insulated roofs, water sprays, water seal decks, floating decks and many others which will not be enumerated.

All of these applications have advantages and some disadvantages. No one of them seems to be 100 per cent effective, each installation depending on so many factors that no hard and fast recommendations can be made for all installations.

LOSSES at the loading rack are considerable and have been given considerable thought by many refiners. The use of vapor tight dome covers has met with some success; however, they still are in the experimental stage and seem to have many disadvantages which make it difficult to use them profitably.

Several refiners spray tank cars with water before the loading and handling operation. This is only done in the summer months. Frequently gasoline loading, whenever possible, is completed during the night and some savings may be accomplished in this manner.

The biggest single factor at the loading rack appears to be the handling of natural gasoline which not only presents a serious fire hazard but also causes large evaporation losses. When the car is vented, it should by all means be done in a closed system where the gases can be collected and either passed to a

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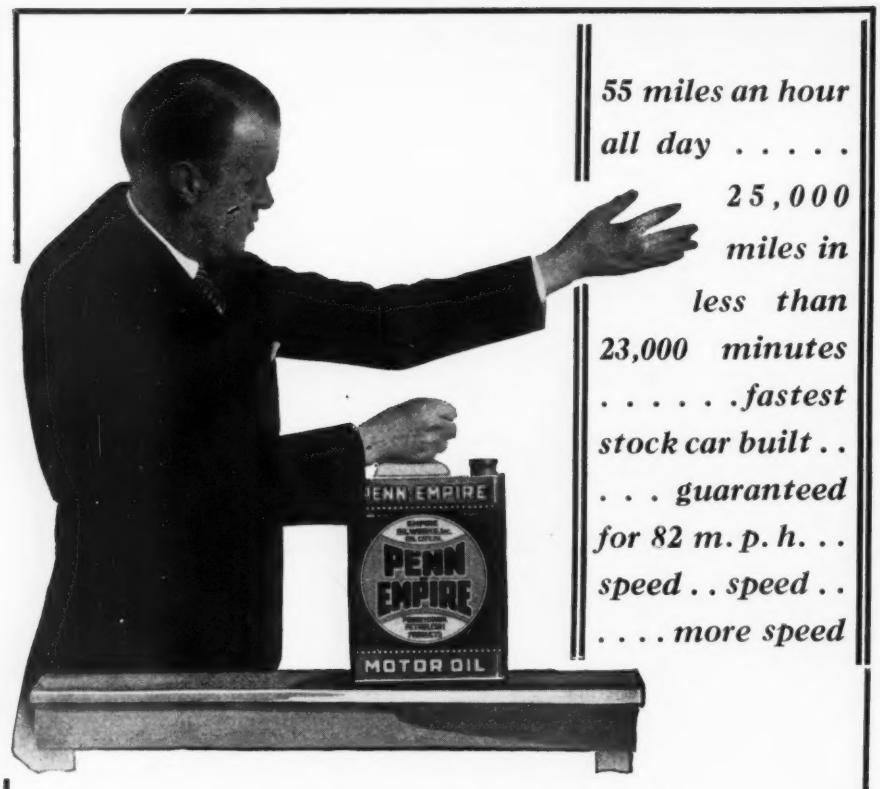

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recovery system or burned. Each refiner has a different situation and no general method of handling can be outlined which would prove satisfactory in every case.

The advent of pressure stills has further increased refinery losses. Practically every pressure still converts part of the charging stock into fixed gases and coke. It is true that neither of these should be considered as a loss inasmuch as they can be recovered and sold at some price; however, they usually are considered as losses, especially the fixed gases and included as such on the yield sheets.

The coke is usually recovered and sold with a very substantial revenue to the refinery. The fixed gas naturally varies with the temperature and pressure used in the unit and the type of charging stock. Its production, together with the very light gasolines, increases the evaporation losses and the handling of these gas and gasoline mixtures is a considerable problem around the pressure stills.

The condensation of pressure still products can be carried on at high pressures which would tend to reduce the amount of gas to a minimum; however, at some time in the operation, this pressure is released and the dissolved gas and gasolines, immediately vaporize and are lost unless some provision is made for collecting them.

MOST pressure stills at the present time are equipped with some type of stabilizer and the installation of such equipment has reduced the gas loss considerably. The fixed gases should be collected and burned in the plant; however, it is very profitable to scrub them with heavy distillates before they are burned as a very profitable amount of gasoline can be saved in this manner.

Some refiners have even found it more profitable to burn fuel oil or natural gas at the refinery and sell the fixed gases produced from pressure stills to local gas companies. The high B.t.u. value of the tail gas makes it very valuable for enriching artificial gas. You have all probably noticed some mention in the journals of this condition.

Up to this point, nothing has been said of gas recovery systems, the only point emphasized being the major sources of losses, causes and how to reduce them to a minimum. After every possible precaution has been taken to prevent evaporation losses, a recovery system should be installed to collect all gases and run them through an absorbing system to recover any gasoline which we have been unable to hold in the tanks. These recovery systems are of three general types, using as an absorbing medium either naphtha or heavier oils and third, the charcoal

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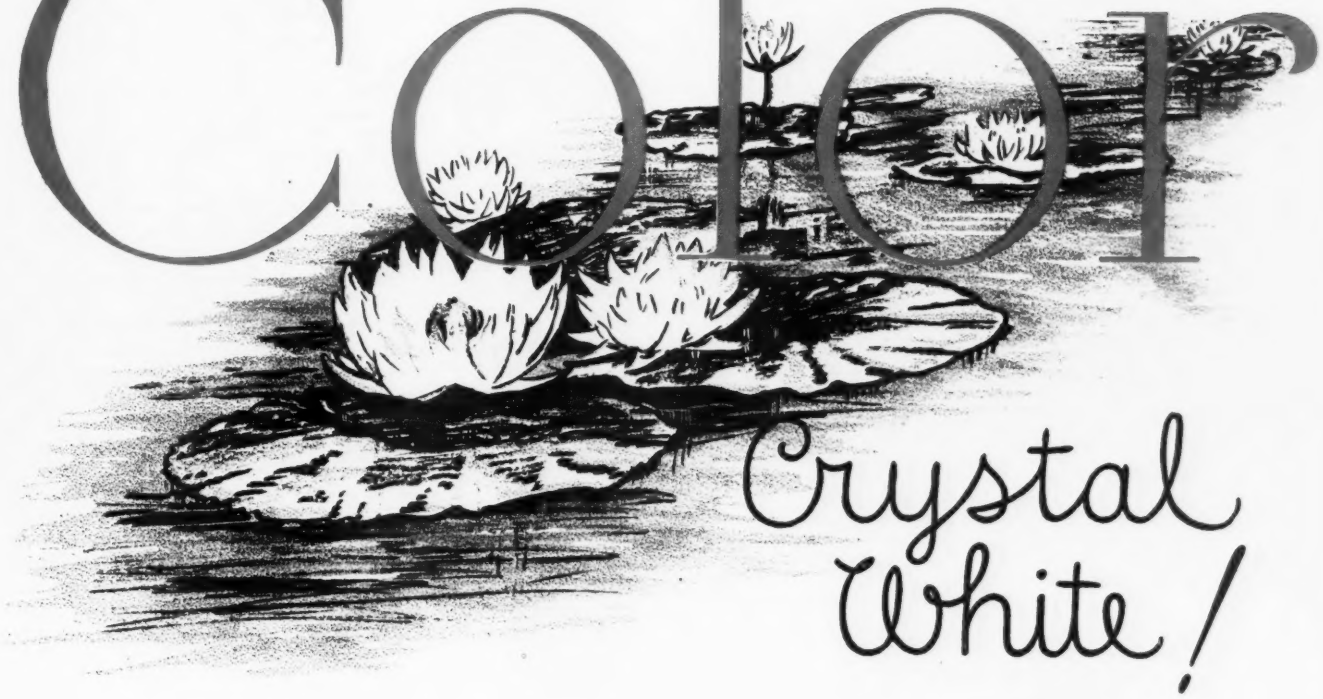

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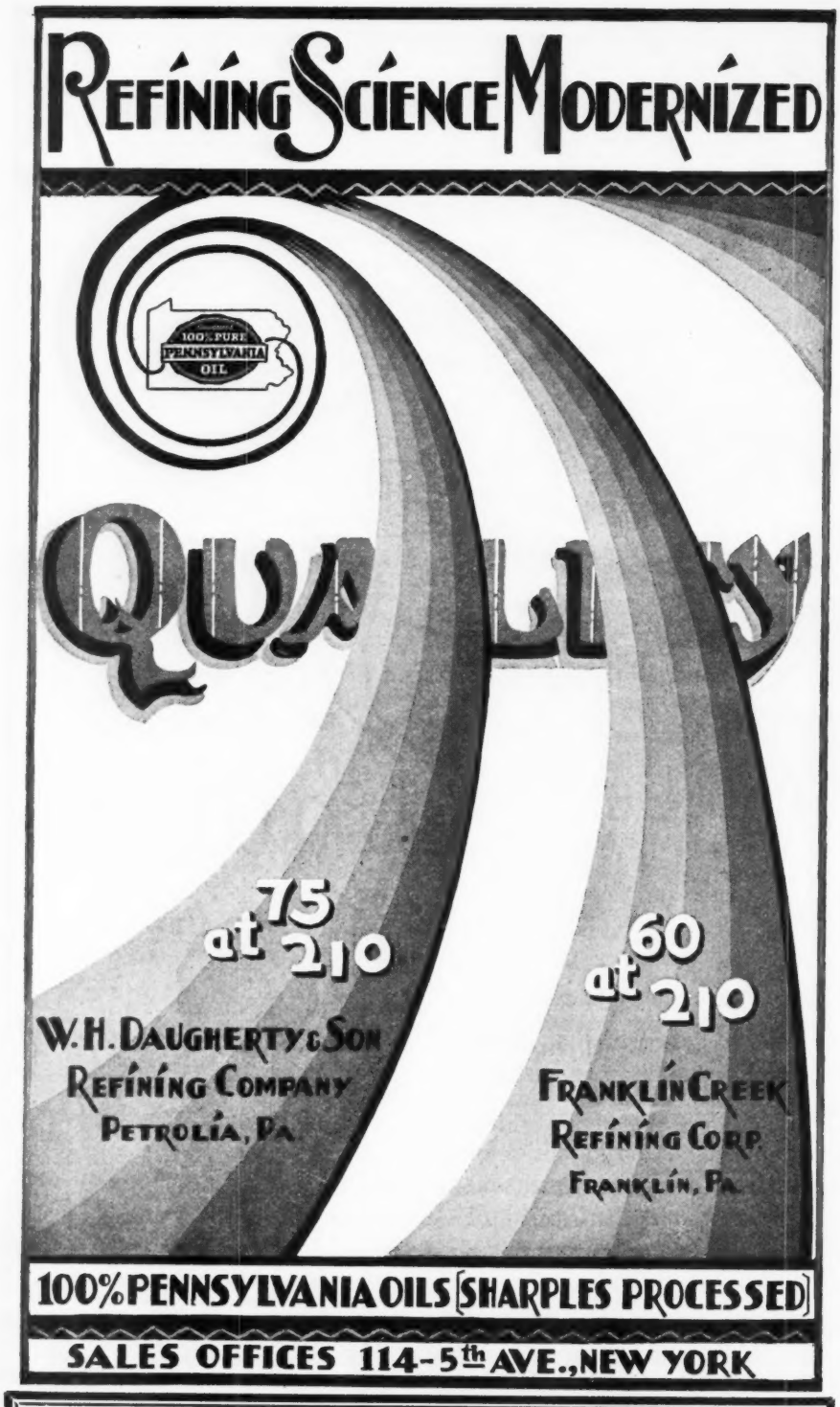
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absorbers. All three systems require a gas collecting system with a vacuum pump to collect the gases and raise the pressure to 10 or 15 pounds.

The naphtha absorber can be operated at lower cost; however, it is not as efficient as the absorption oil type. Charcoal absorbers have not been generally used in refineries but it is my understanding that they are now being developed for this service.

The grouping of tanks and connecting them with equalizing lines will reduce the number of regulators to be installed and at the same time reduce the amount of gas handled by the absorbing system. It will also allow the use of natural gas or tail gas for the breather medium and in this way, reduce the fire hazard.

In closing, I might point out again that the demand for lower boiling point range motor fuels of anti-knock quality is forcing the refiner to more exacting methods of handling these products and eventually the time will come when we will be forced to handle all our products in gas tight equipment if we are to meet the demands of the marketer and still make a satisfactory revenue. It is not impossible that sooner or later each refiner will store his fixed gases in the same manner as he now stores his liquid gasoline. This would require gas holders and tanks being filled would force the gas into the holder to displace the oil from the tank being emptied. A recovery system would then be used to handle the gas production of the refinery.

Exporter to Build Tanks In South America

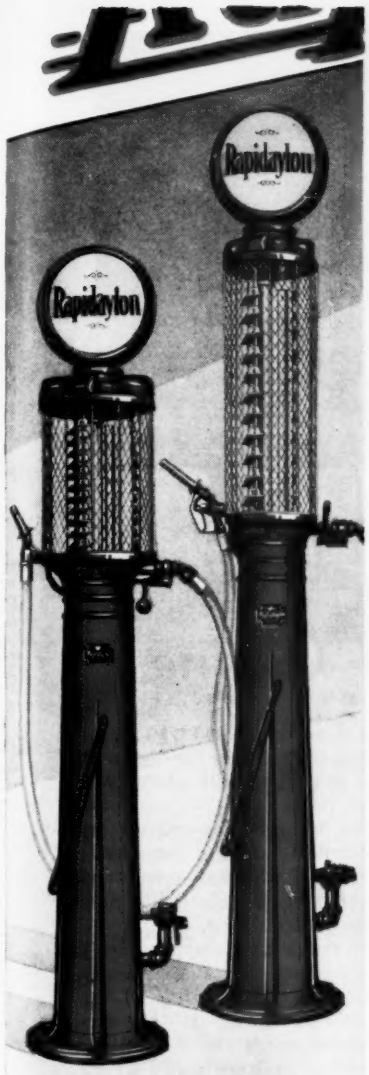
CHICAGO, June 15.—Henry E. Brandli, vice president and general manager of the Cities Service Export Oil Co., has just returned from a four-month inspection trip through South America, where the company contemplates installing steel storage tanks at several ports for receiving bulk shipments of gasoline and kerosene for distribution through the countries.

Shipments are now being made to these various ports in cases and drums. However, owing to the rapid increase in consumption, especially in the Argentine, Uruguay, and Brazil, case and drum shipments are uneconomical, making necessary bulk installation.

Tanks will first be installed in the Argentine, and later in Uruguay and Brazil. Mr. Brandli was most favorably impressed with conditions in the Argentine and Uruguay.

W. R. Johnson Transferred East

TULSA, June 15.—William R. Johnson, who has been at the Tulsa sales offices of the American Schaeffer & Buddenburg Co., has been transferred to New York. He is being succeeded here by G. N. LaMont from the Houston office.



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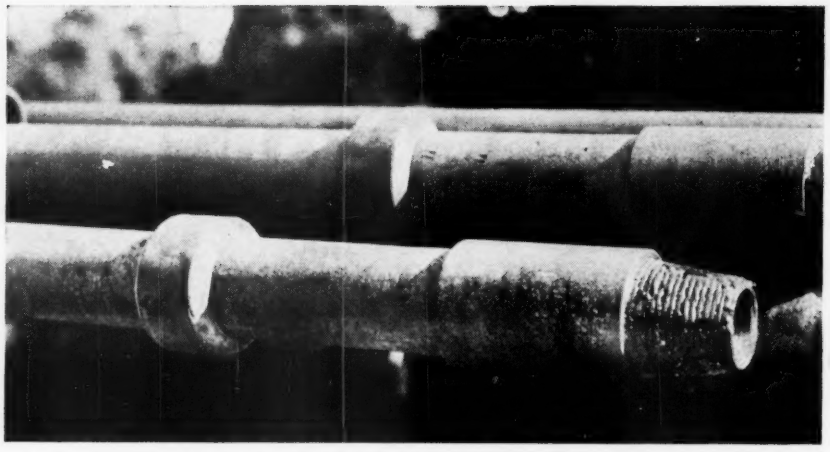

Rubber anti-friction rings on drill stem just above couplings

Rubber Anti-Friction Rings on Drill Stem Protect Casing

Staff Special

HOUSTON, June 15.—Use of rubber anti-friction rings, or casing protectors, is proving a solution for one of the problems of deep well drilling in the Gulf Coastal region. The rings, which slip over the rotary drill stem very tightly, keep tool joint couplings from making a grinding contact with the casing walls. Both the casing and couplings are saved from wear.

Anti-friction rings are described by their users as being of especial value while drilling with heavy, sandy, mud-laden fluid in the hole. This material causes more grief than lighter mud because of the greater friction it sets up.

W. C. Thomas, production manager of the Vacuum Oil Co., which uses anti-friction rings in the Lockport, La., field, has one installed on every second joint of the drill stem. "Bink" Manning, general superintendent in Gulf Coastal territory for Humble Oil & Refining Co., has installed them on each joint in the drilling of deep wells, sometimes single and sometimes double.

Rubber anti-friction rings serve a similar purpose to the use of ball-bearing tool joints on the Pacific Coast. The soft metal balls on the tool joints used there will wear out, but may be readily replaced. Ball-bearing tool joints were described at the recent American Petroleum Institute engineering meeting in Fort Worth by R. A. Wilson, of the Guiberson Corp., Dallas, as being about as effective as rubber rings.

Discussion of casing protection at that meeting disclosed that Mr. Manning's field men had drilled 5004 feet recently with 200 horsepower engine and set 4644 feet of 26-pound, 6¼-inch casing, drilling through the 6¼-inch with 3-inch, using rubber anti-friction tool joints on drill stems to complete the hole. He had found, he said, that protecting the casing with rubber rings on the drill stem was an important item.

Mr. Thomas uses casing protectors at shallower drilling depths than some of the other Gulf Coastal operators, installing them on 4-inch drill stem inside the 9⅝-inch casing.

The rubber rings are comparatively inexpensive, costing about $8 each, hence the practice is growing of installing them whenever it appears there is to be much hard drilling ahead. In drilling in hard rock, where progress is so slow that the drill may be described as "staying in one place a long time," protectors are especially valuable to prevent wearing the casing through.

New Patents

May 29, 1928

REFINING

Apparatus for the Treatment of Hydrocarbon Compounds—Earl R. Hamilton, Pekin, Ind. Filed Nov. 17, 1924. No. 1,671,423.

Catalyzer for Manufacture of Light Hydrocarbons—Lazer Edeleanu, Berlin-Charlottenburg, Germany, assignor to Allgemeine Gesellschaft fur Chemische Industrie, Berlin, Germany. Filed Jan. 20, 1925. No. 1,671,517.

Process for Catalytic Cracking of Heavy Hydrocarbons, Mineral Oils, Oil Residue, Tars and the Like—Edgar Erlenbach, Berlin, Germany, assignor to Sinclair Refining Company, Chicago, Ill. Filed Aug. 15, 1922. No. 1,671,573.

Apparatus for Sulphonating Oils—Alexander Horwitz, New York, N. Y. Filed June 22, 1921. No. 1,671,586.

Method of Obtaining Nitrogenousbase Oils from Hydrocarbon Materials—Harry K. Ihrig, Martinez, Calif., assignor to Sumner E. Campbell, Associated, Calif., and to Associated Oil Company, San Francisco, Calif. Filed Nov. 8, 1926. No. 1,671,721.

PRODUCTION

Device for Plugging Oil Wells—Nathan Goff Britton, Newberne, W. Va. Filed Oct. 18, 1927. No. 1,671,223.

Water-Pressure Underreamer—Frederick William Jones, Los Angeles, Calif. Filed Nov. 7, 1923. No. 1,671,474.

MISCELLANEOUS

Tank-Pressure Control—Stanley D. Clithero,

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Speed in getting the hole down is essential to Drilling Economy.

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STANDARD Tanks have set an enviable standard for steel storage the country over. The in-built quality is the result of over a score of years of careful workmanship.

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National Petroleum News
1213 W. 3rd Street Cleveland, Ohio

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OLD Sweetland Filters will handle the fine clays used in the contact process but new Sweetlands will handle them just so much better. New models have certain added improvements over old models.

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Hazleton, Pa.—Los Angeles Office, Central Building

Other Offices in Chicago—New York—Salt Lake City
Export Office—25 Broadway, N. Y.—Code Address, Unifilter, New York

Long Beach, Calif. Filed June 6, 1927. No. 1,671,275.

Retort for Carbonizing Bituminous Fuels—Josef Plassmann, Duisburg, Germany. Filed July 10, 1925. No. 1,671,448.

Float for Use in Storage Tanks for Volatile Liquids—Bernard Newman and Oliver Wickham, Grays, England. Filed Nov. 29, 1926. No. 1,671,650.

June 5, 1928

REFINING

Conversion of Hydrocarbons—Harald Nielsen, Muswell Hill, England, assignor to Bryan Laing, Hatfield, England. Filed Nov. 27, 1922. No. 1,672,081.

Process of Purifying Mineral Oils—Marvin L. Chappell, El Segundo, George J. Ziser, Los Angeles, and Ernest L. Moyer, Hermosa Beach, Calif., assignors to Standard Oil Company of San Francisco, Calif. Filed Aug. 18, 1924. No. 1,672,304.

Distillation of Oils with Catalysts—George L. Prichard and Herbert Henderson, Port Arthur, Tex., assignors to Gulf Refining Company, Pittsburgh, Pa. Filed Nov. 28, 1921. No. 1,672,339.

Process and Apparatus for the Distillation and Cracking of Hydrocabon Oils—Hermanus Johannus Jansen, Schiedam, Netherlands. Filed July 13, 1925. No. 1,672,459.

Refining Oil—Joseph R. Neller, Pullman, Wash., and George M. Vance, Tulsa, Okla., assignors to The Texas Company, New York, N. Y. Filed April 30, 1923. No. 1,672,621.

Apparatus for Treating Hydrocarbon Oils—Frank E. Wellman, Kansas City, Kans. Filed March 20, 1923. No. 1,672,668.

Electric Cut-Out for Stills and The Like—Lester F. Boss, Woods Hole, Mass. Filed May 12, 1926. No. 1,672,800.

Fractionating Hydrocarbon—Warren K. Lewis, Newton, Mass., and Alfred A. Wells, Roselle Park, N. J., assignors to Standard Oil Development Company. Filed March 5, 1924. No. 1,672,849.

PRODUCTION

Oil-Well-Cleaning Device—Ralph L. Buck, Jamestown, N. Y. Filed Nov. 22, 1926. No. 1,672,200.

Rotary Jar—James A. Kammerdiner, Los Angeles, Calif. Filed Nov. 29, 1926. No. 1,672,321.

Rotary Jar—Charles V. North, San Gabriel, Calif. Filed Nov. 20, 1922. No. 1,672,464.

Guiding Means for Oil-Well Pump Rods—Earl C. Meier and Anthony C. Brammer, Wichita, Kans. Filed Sept. 15, 1925. No. 1,672,850.

NATURAL GAS

Means for Desulfurizing Gases—Emil Raffloer, Duisburg-on-the-Rhine, Germany, assignor to Wm. E. Leuchtenberg, New York, N. Y. Filed June 11, 1926. No. 1,672,778.

MISCELLANEOUS

Combination Tank Vent, Flame Arrester and Snuffer—George C. Schmidt and Frank G. D. Muller, Houston, Tex., assignors to The Staytite Company, Houston, Tex. Filed Aug. 21, 1926. No. 1,672,042.

Breather-Pipe Attachment—Charles Priddy, McAlester, Okla. Filed Aug. 2, 1927. No. 1,672,135.

Coke-Extracting Mechanism for Vertical Retorts for the Distillation of Carbonaceous Materials—Frederick Joseph West and Ernest West, Manchester, England. Filed June 6, 1927. No. 1,672,442.

Fuel-Distilling Apparatus—Frank E. Hobson and James F. Shelton, Bellingham, Wash. Filed April 6, 1925. No. 1,672,860.

New Lube Plant In Louisiana

SHREVEPORT, June 15.—The Bayou State Refining Corp. is building a 600-barrel lubricating oil refinery at Hosston, La., to operate on a pure asphalt base lubricating oil crude being produced in that area. The plant will be ready about July 1.

The Bayou plant is being built by the Graver Corp. using the Schultz vacuum process. It is expected to recover about 45-50 per cent lubricating oil, 25 per cent gas oil and 25 per cent residuum. The residuum will be blended back with the gas oil to produce fuel oil of commercial specifications.

G. C. Longman of Chicago is president of the new company. S. M. Cook of Shreveport is vice president and Frank Cook of Shreveport is secretary and treasurer. Shreveport offices are in charge of J. F. Knox.

White Star Sells Engineering Service And Fuel Oil Stays Sold

By J. C. Chatfield
N. P. N. STAFF WRITER

ST. LOUIS, June 15

BY APPROACHING the sales problem from an engineering standpoint the White Star Refining Co. at Wood River, Ill., created a steady outlet for all its surplus Dubbs residuum fuel. With that sales problem solved the company has been able to continue the operation of its cracking stills on a heavy residuum basis rather than to run the cracking stock down to coke.

The company had been having trouble with the residuum fuel it sold in the open market. The fuel was easy to sell in the first place, but difficult to keep sold. Under certain conditions suspended matter in the fuel would drop out in transit and the oil be refused at destination.

J. B. Edwards, general manager of the company, had discovered that the Dubbs residuum could be used successfully for fuel at the White Star plant by keeping it hot and keeping it moving. The high B.t.u. content of the oil made it a valuable fuel, but only half of the production could be utilized. He began to look for a large fuel consumer who might be convinced of the value of the oil if properly handled.

One Consumer Takes All

The LaClede Steel Co. of St. Louis was chosen as a good prospect. This company now consumes all the Dubbs fuel from the White Star plant which is not burned at the plant itself.

Mr. Edwards is an engineer of many years experience. He undertook the sales work more as a problem of engineering service to the LaClede Steel Co. than from the usual selling angle. A method for burning the heavy fuel was devised for the prospective customer, and details of delivery worked out to fit in with the plant operating schedule, with the result that the steel company now recovers a much greater amount of heat per dollar spent for fuel, while the White Star has an assured outlet for an otherwise troublesome product.

Refiners with Dubbs cracking plants which they operate on a liquid residuum basis have found it possible to burn the fuel by charging it to an insulated tank equipped with steam coils. From this tank the oil is circulated to burners through a belt line, part of the fuel always being returned to the supply tank. The supply tank must be cleaned of precipitated carbon at intervals.

From Tank Car to Burner

A somewhat similar system was devised for the LaClede Steel Co., with certain modifications to make it easier for the customer to handle. At the LaClede plants fuel is pumped direct to the burners from White Star tank cars. An excess capacity belt line carries fuel from cars to the burners and returns unused fuel to the cars. The line contains no sharp bends.

To facilitate serving the plant and provide a steady source of fuel at all times, a double track unloading switch was installed for the steel company. Two cars may be set on each track opposite steam lines, unloading lines and lines for returning excess fuel. Flexible hose connections are used for pump-out and return lines.

Each of the LaClede plants being served burns a car and a half of fuel every 24 hours. Each morning there is one empty car and one car half filled with fuel on one of the two tracks at each plant. Two full cars are spotted on the opposite track and connected with steam lines for 20 minutes to be heated. One of the full cars is connected to the belt system before the half car is emptied and as soon as both the old cars are emptied the hose connections are changed and the two empties are ready to be returned to the refinery. By using this system the fuel circulating pump is always drawing oil from a tank car.

Schedule for Deliveries

A schedule of deliveries was worked out with the railroads so that the fuel is loaded out at the White Star plant every night at 10 o'clock. Delivery is made to one plant at 7:30 the following morning and at the second plant at 11 o'clock.

To provide for possible failure of the transportation system, the reserve storage tanks of the customer were filled with 24-26 or 26-30 straight reduced fuel, which can be kept in an unchanged condition over an indefinite period. The few times this fuel has been used have been marked by complaints from the customer because of the lesser heat obtained per barrel consumed.

At the LaClede plants 80 per cent of the fuel pumped from the cars is burned and 20 per cent returned on each cycle. A National ball type pump is used to circulate the oil. Skookum burners supply the oil to the furnaces.

To clean out any deposits which may accumulate in the short length of burner feed lines leading from the belt line to the burner a steam kicker is installed in each line. In case of clogging a charge of steam can be shot into the line. This method has always succeeded in clearing out obstructions.

GREAT care is used in keeping the tank cars in first class shape for servicing the fuel. All incoming cars are thoroughly swept out when they are spotted on the White Star loading rack. Steam coils are tested before every trip. This is done to prevent boiling over on the customer's siding when the cars are being heated or sputtering of the fires in the furnace.

The White Star plant produces approximately 1,250,000 gallons of Dubbs residuum fuel per month. Of this approximately half is burned at the plant and half sold to the LaClede Steel Co.

In the period before the sale to the steel company the refinery built up a large amount of largely solidified residuum. Mr. Edwards now is working on a method of reclaiming this pitch for burning in the plant. It is to be done by grinding and mixing with other plant fuel.

KANSAS CITY, Mo.—Roy Spear, sales manager of the Interstate Oil Co., Kansas City, spent a recent week end with Mr. Ryan of the Ryan Oil Co., Warsaw, Mo., in a fruitless endeavor, it is reported, to catch the finny tribe.

KANSAS CITY, Mo.—Avery Maloney, of the Security Oil Co., Fort Scott, Kans., is another golf enthusiast among the oil men, according to Earl Van Buskirk, of the Butler Mfg. Co.

LOS ANGELES, June 18.—Glen Wilcoxson, engineer with the Lucey Products Corp. of Tennessee, recently arrived in Los Angeles to be service engineer for the company at its Los Angeles plant.

Our Industry — A Page of Facts and Personalities

National Petroleum News

By Paul Wagner

Achievements in safety work are recorded in a report on accomplishments made in 1927 by the Standard Oil Co. of California. The company frequency rate, which expresses the number of lost time accidents per hundred men, was reduced 17.7 per cent below 1926. The severity rate, which expresses the days lost per man, was cut 11.7 per cent below 1926.

El Segundo refinery, with an average of 1319 men employed in 1927, went the entire year with only nine lost time accidents, establishing a company record. The frequency rate at El Segundo is described as only 2.7 per cent of what it was in 1919.

Richmond refinery, with an average of 2891 men employed, went 78 days without a lost time accident. This is theoretically equivalent to 1000 men working seven and a half months without accident. It makes more man days worked without a lost time accident than the company ever had before.

Detailed figures were not made public, but the pipe line department lowered both its frequency and severity rates for the fifth consecutive year. The frequency rate is now 75 per cent lower than in 1922 and the severity rate 69 per cent lower.

The producing department reduced accident frequency 20 per cent below 1926 and severity 27 per cent. Marine department cut frequency 21 per cent and severity 28 per cent. The sales department lowered the frequency rate 8.2 per cent.

* * *

Charles G. Laskey has been made president of the newly organized Southwest Gas Utilities Corp., which has controlling interest in the Southwest Gas Co., the Northwest Louisiana Gas Co., the People's Gas & Fuel Co., and others in Oklahoma, Texas and Louisiana. With his partner, George Belchic, Mr. Laskey helped to lay the first pipe line in northwest Louisiana.

* * *

C. W. Reeder, formerly assistant general credit manager of the Union Oil Co. of California, Los Angeles, has succeeded the late W. C. Trew as general credit manager. Mr. Reeder has been with the Union continuously since 1915, when he left the New York City offices of the Pennsylvania Coal & Coke Corp., to move to the Pacific Coast.

Left to right, H. J. Corcoran, Walter B. Pyron, and W. S. Farish

THE camera caught executives of three important oil organizations talking things over as they waited for their taxicabs in a Texas city recently.

From left to right, the picture shows:

H. J. Corcoran, president, Reagan County Purchasing Co., Fort Worth, which handles the Marland crude contract with the Big Lake and Texon-Group 1 companies in the Big Lake field.

Walter B. Pyron, third vice-president, Gulf Production Co., Houston, who spends his hours of recreation playing polo.

W. S. Farish, president, Humble Oil & Refining Co., Houston, and also past president of the American Petroleum Institute.

* * *

RUPERT P. RICKER, member of the San Angelo partnership of Ricker & Dodson, has been elected president of the newly formed Black Arrow Oil Co., capitalized at $1,000,000. Associated with him are Floyd C. Dodson of San Angelo, Loren L. Hillman and Carl T. Young of Los Angeles. Judge W. W. Hubbard of San Angelo is the legal member of the company.

* * *

William Groundwater, manager of transportation for the Union Oil Co. of California, Los Angeles, has been appointed to serve on the American committee of classifications, Lloyd's Register of Shipping.

Herbert O. Wilson has been transferred from the accounting department to the credit department at the Shreveport general offices of the Louisiana Oil Refining Corp.

* * *

C. C. Rickard, formerly at Pyote for the Texas Pipeline Co., is now in charge of the McCamey, Texas, district. He succeeded E. J. Blackwell, who recently resigned to retire to his Kansas farm.

* * *

W. A. Thomas, field geologist in the eastern states for the Pure Oil Co., is now stationed at Saginaw, Mich. He is assisted there by William F. Brown, formerly with the Michigan Geological Survey at Lansing.

* * *

R. E. McDaniels, formerly in the production department of the Mexican Gulf Oil Co., at Tampico, is now at Maracaibo, where he is employed by the Venezuela Gulf Oil Co., another arm of the far flung petroleum interests of the Mellon family.

* * *

W. M. Lawrence of the People's Gas & Fuel Co., is now located at Vivian, La., north of Shreveport in the Caddo district. He was transferred there from Ferriday, La.

* * *

Frank R. Clark, chief geologist of the Mid-Kansas Oil & Gas Co., subsidiary of Ohio Oil Co., is now in charge also of geological activities of the Ohio-Mexican Oil Co., a part interest subsidiary. The Ohio-Mexican is drilling two tests in northern Coahuila, Mexico, west of Villa Acuna, which is just across the Rio Grande from Del Rio, Texas. Drilling reports showed the No. 1 Zambrano test down 4237 feet in sandy lime, late in May; the No. 2 San Marcos, near Cuatro Cienegas, at 3314 feet.

* * *

W. F. Earl of the geological department of the Transcontinental Oil Co., Tulsa, recently was transferred from Coalgate to Okemah, Okla.

* * *

Jim Hubble of the central Ohio producing division of the Pure Oil Co., at Newark, is recuperating from an illness at Albuquerque, N. M.

* * *

Frank Phillips, president of the Phillips Petroleum Co., Bartlesville, has been elected a director of the Chatham-Phenix National Bank & Trust Co., New York.

* * *

R. V. Cunningham was promoted on June 1 to district representative at Roanoke for The Texas Co. Mr. Cunningham's territory includes southwestern Virginia and a part of West Virginia. R. M. Schulken, formerly in charge of this district, was transferred to Charlotte, N. C.

New Publications

Albert E. Miller, process chemist of the Sinclair Refining Co., has written the following brief review of "Die Verflüssigung der Kohle nach Fr. Bergius," by Dr. Walter Friedmann of Germany. The book was published in January, 1928 by Allgemeiner Industrie-Verlag G.m.b.H., Berlin. The title means, in English, "The Liquefaction of Coal According to Friedrich Bergius" and it deals with that subject. Mr. Miller says the book may be divided into three main divisions as follows:

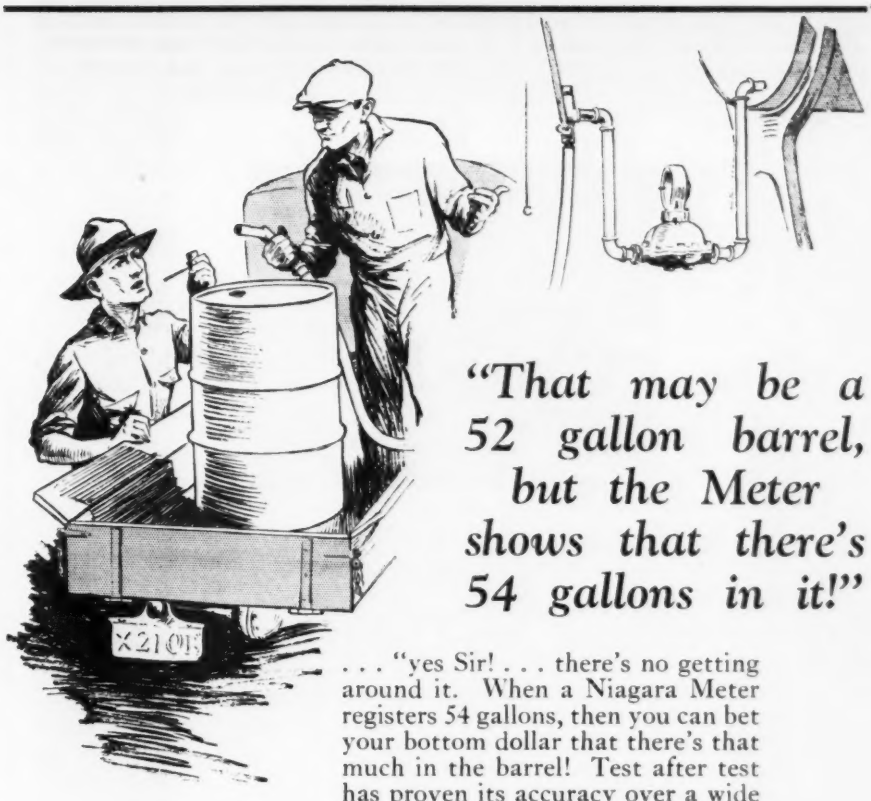
I—Introduction pp. 7-22. Development of coal liquefaction through necessity to keep up with America. Gradual change from wood to coal as source as forests disappeared. Technical development depends on economic conditions, not vice versa. Idea developed to use gases from dry distillation of coal for illuminating. Perkin's discovery of the first aniline dye in 1856 is taken up.

This caused increase in demand for tar and price went up. Demand for liquid fuels is always increasing. Economical consideration given and consumption of energy (fuel) by motors. He calculates that economically oil may be used for boiler heating when the same weight does not cost more than 2 or 2½ times as much as coal. Benzols from tar distillation are superior to the easily inflammable benzine with its low compression ratio. Cracking is discussed very briefly.

II—Invention of Bergius pp. 22-47. "The Use of High Pressure in Chemical Processes and Copying of the Formation Process of Mineral Coal," (1913) by Bergius is here discussed. How pressure could be used to advantage in chemical reactions is taken up—e.g. action of highly compressed oxygen on chalk gives calcium peroxide. He then investigated the action of steam and oxidizing agents at high temperatures. At 300 degrees C. under pressure he got carbonic acid and hydrogen, but when pressure was not used the same products were obtained at 650 degrees C. He investigated the production of hydrogen by the action of steam on iron. The origin of coal is considered as viewed by various individuals as David White and Thiessen, Pontonie, Engler, Cagniard de Latour, Norlin, Stein, W. A. Bone.

The work of Berthelot is mentioned, and Ipatiew, Sabatier and Senderens, Willstätter. Pictet distilled coal in vacuum. The work of Bergius, development of the apparatus, the various patents, articles, etc., are discussed in some detail, but no patent numbers, references, etc., are given.

III—48-59. Technical advances, yields, prices are given. The outlook for the future is good, accord-



"That may be a 52 gallon barrel, but the Meter shows that there's 54 gallons in it!"

. . . "yes Sir! . . . there's no getting around it. When a Niagara Meter registers 54 gallons, then you can bet your bottom dollar that there's that much in the barrel! Test after test has proven its accuracy over a wide range of operating conditions."

Automatic Meter Accuracy!

AMONG the hundred or more uses of Niagara Oil Meters, probably the most outstanding are the uses to which these meters are put by petroleum marketers. Progressive dealers and wholesalers everywhere are using them for measuring storage tank fillings and tank-truck loadings. Tank car fillings and deliveries are accurately checked; drum fillings measured and totaled; gasoline is measured from one tank to another . . . all automatically, without fire hazard and without loss of time.

Whatever your requirements may be, there are types of Niagara Oil Meters that will meet them. Mail the coupon today for full information.

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☐ Please send us a copy of your Niagara Oil Meter Booklet. Show us how Niagara Oil Meters can be adapted to the measuring of:

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58-60 U. S. Motor Gasoline
64-66-375 E. P. Aviation
41-43 W. W. Kerosene
36-38 Straw Distillate
32-36 Gas Oil Uncracked
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24-26 Fuel Oil or Blackwell)

Cushing CANNON BALL Service is something you can depend on. If we say it will be shipped to-day, it will be shipped that day, not the next or a week later.

CANNON BALL Service guarantees you service when you must have it and assures you prompt service when you would like to have it.

A service that can't be beat on Petroleum Products of highest quality, that is the Cushing reputation.

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CUSHING

Refining & Gasoline Co.

Refineries At CUSHING & BLACKWELL, OKLAHOMA

Bring New Customers and Hold Your Old Ones

ALLISON COUPON BOOKS

Accurate—Compact—Convenient

Popularize the coupon book habit at YOUR filling stations. Sales organizations, truck fleets and individual drivers prefer this plan once they try it. Allison Coupon Books are absolutely accurate. Furnished in stock or special designs. Send for samples and prices.

Allison Coupon Company

Indianapolis, Indiana

Coupon Book Specialists Since 1888

ing to the author, technical advances, coal as raw material.

This booklet seems good in discussion, etc., but no exact references of any kind are given. No patent numbers, journal names, page references are given. It would be impossible to follow up the references given throughout the article and final bibliography, which is not at all specific, does not give all material within the paper. The subject matter contained within the article seems well gotten up otherwise.

Drilling Pact Effects Fuel, Water Economy

TULSA, June 16.—Economies in drilling fuel and water costs are to be effected by a new wrinkle in the drilling contracts offered by the Barnsdall Oil Co. Believing that his company should not be penalized for fuel and water wasted by drilling contractors, R. F. McArthur, vice-president of the Barnsdall, inaugurated a system by which his company offers a bonus to the efficient contractor with the most up-to-date and economical equipment.

Fuel and water still are furnished the contractor, but he is charged for them according to the standard rate for these commodities in the locality of the operation. The Barnsdall increases the price per foot which it pays for drilling the well in the amount which should normally cover the cost of fuel and water in the formations through which the well is expected to pass.

Under this arrangement, the contractor whose men are the least wasteful, and whose equipment is the most efficient, actually makes money through using less fuel and water than that consumed by the general average in the field. The Barnsdall benefits doubly, as it does not pay for wastage, and because only the contractors with the most efficient equipment can undertake to carry out this clause of the contract at a profit.

In the new fields, where competitive drilling is under way, the company profits also from a greater flush production from wells drilled in in advance of others in the field. And it takes the best contractors to make the best time safely.

Two 1600-barrel water tanks are set at the well. Water is drawn from one as the other is being filled, and the contractor charged at the agreed rate for the amount used, which is determined by a gage of the tanks. Gas, of course, is metered to the boilers. When the boilers are being fired with oil, the oil is gaged like the water.

NEW YORK, June 18.—Prudential Oil Corp. has changed its name to the Prudential Refining Corp. as of May 28. General offices are at 90 West St., New York. The company operates a refinery at Baltimore.

New Equipment

Gilbert & Barker Mfg. Co., offers to companies contemplating building new service stations, or remodeling their present stations, sets of plans covering four types. These are complete architect's plans, including all elevations, specifications, measurements and necessary construction details. The company sells them for $1 for one complete set.

The four designs include Colonial, Old English, Spanish mission and one design for brick construction, with canopy over a double drive. A recent catalogue issued by the company gives suggested layouts for stations on various size lots.

* * *

The Lucey Products Corp. of Tulsa is to open stores in Houston and Shreveport, according to an announcement by F. E. Bernsen, vice-president of the company. Lucey rotary drilling equipment, manufactured by the Lucey Manufacturing Corp. of Tennessee will be stocked by these branches. These stores will not displace the T. T. Word Supply Co., which will continue as distributor of Lucey products in south Texas, Louisiana, and Arkansas.

R. S. Levering, long a member of the Lucey organization, will be manager of sales for the southern division. W. E. Risley has been transferred from the plant at Chattanooga to the Tulsa territory.

* * *

The Kennedy Valve Mfg. Co., Elmira, N. Y., which was founded 50 years ago by Daniel Kennedy, who was president until his death last January, has elected these officers: Mathew E. Kennedy, president and treasurer; J. Carroll Kennedy, vice president and secretary; and Clarence H. Kennedy, vice president and general sales manager. All officials are sons of the founder.

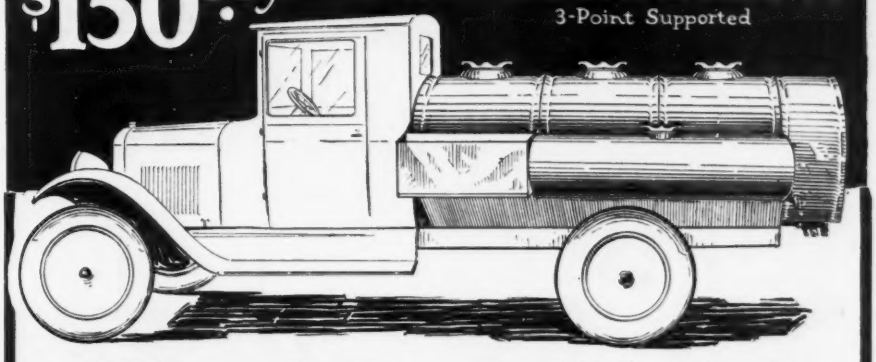
* * *

Barney Barnwell, assistant sales manager of Axelson Machine Co., Los Angeles, is spending about six weeks touring the Mid-Continent oil fields. "Dutch" Zwerneman, formerly in charge of the Santa Fe Springs territory for Axelson Machine Co., Los Angeles, has been appointed assistant to D. M. Hammett at the Tulsa office of that company.

* * *

Sharpsville Boiler Works Co., Sharpsville, Pa., has off the press bulletin M-3 on the Sharmeter, a dispensing system for motor fuels. The bulletin gives complete information on the operation of this system by air pressure, electric drive, either direct or remote control or by gravity, as well as on the mechanical features of this unit.

$150.00 for this Convertible TRUCK TANK
3-Point Supported



60 Extra Gallons In Side Tanks

IN THE space of an hour you can switch from side racks to side tanks—a 30 or a 50 gallon tank on each side—adding 60 or a 100 gallons capacity to care for extra demand on gasoline, kerosene or lube oil. This is just one of the convertible features of the New Convertible Truck Tank. It is 3-point Supported. The tank, the mounting, the pipe lines and the bucket box are welded into an integral unit of steel. It is interchangeable on Chevrolet Trucks or the New Ford Truck and others with back of cab lengths around 80 inches. Capacity 375 gallons.

$150.00 includes side racks f. o. b. Kansas City.
Faucets, side tanks and side barrel carriers are extra.

COLUMBIAN STEEL TANK COMPANY

1507 W. 12TH ST. — KANSAS CITY, MO.

Partition mounting reduces weight and lowers tank.

COLUMBIAN Partition Mounted 3 Point Supported TRUCK TANK

3 point support solves torque and vibration problem.

Gasoline and Oil Filling Stations
and Steel Buildings

We manufacture the simplest to the most elaborate Stations. Put your own individuality in your Filling Stations—Let us help you work this out.

The Edwards Manufacturing Co.
524-544 Eggleston Ave. Cincinnati, Ohio

Old Counting Methods *versus New*

For centuries the use of the abacus or suan pan has been the instrument for arithmetical calculations in the Orient. Though still in use this slow ancient method is gradually becoming extinct due to the innovation of modern adding devices which blaze the way for inevitable progress.

WITH the new Correct Measure automatic counter device installed, all other methods for keeping a check on gallons sold, can be eliminated. This device, working simultaneously with the movement of the measuring handle, automatically keeps an accurate and unfailing check on the number of gallons sold in a day, week, month or year.

When the measuring handle is in any notch for delivery to the customer, gasoline cannot be pumped into the bowl. To fill the bowl the measuring handle must be in the notch marked "To Fill". When in position to fill, it is impossible to open the discharge valve. When the measuring handle is placed in the notch marked "To Drain", the discharge valve remains closed unless the hose nozzle is inserted in the drain back which releases the locking device and automatically opens the discharge valve.

This automatic counter device is installed in either the hand or electric Correct Measure pumps at a small extra cost. In comparison with other methods of keeping records, where the human element is involved, this automatic counter is an invaluable asset.

Prices and complete information on the Correct Measure Automatic Counter will be Mailed to interested oil marketers on request.

C O R R E C T

ON THE LAZY BENCH

National Petroleum News

Lady—driving up with a nearly empty tank:

"Put in two please, and go slow on the last one."

—Acme Service & Supply Shop, Bath, Maine.

* * *

Gnot If We Gnow It

"The Gnu in Danger of Extinction," says a head-line. Shall this popular little crossword animal disappear? Gno, Gnever!—*Pennico News.*

* * *

"Our maid has sharp ears."

"Yes, I notice the doors are scratched up around the key-holes."

—Skelly News.

* * *

It was a sour morning after. He raised on one elbow and gazed with disgust at the angora walking across the room. In desperation he moaned, "Cat, for Pete's sake, quit stamping your feet!"—*The Nokol News*

* * *

Teacher: What were the epistles?

Little Boy: Wives of the apostles.

—The Pure Oil News.

* * *

If clothes make the man, some men ought to change tailors.

—The Pure Oil News.

* * *

"I took the recipe for this cake out of a cook book."

"You did perfectly right—it should never have been put in."—*Pennico News.*

* * *

The professor had just finished talking on Sir Walter Scott and his works when a lady said: "Oh, professor, I have so enjoyed your talk. Scott is a great favorite of mine."

"Indeed," said the professor. "What one of his books do you like best?"

"Oh, I haven't read any of his books but I'm so fond of his Emulsion."—*The Marion Line*

* * *

Cadillac—"I once loved a girl and she made a fool of me."

Benny—"What a lasting impression some girls make."—*Pennico News.*

* * *

"Mandy, I'se a sick man," said Jake, looking very miserable. "At de horspittle dey says I'se got berkerlosis."

"All right, Jake, we'll take keer of you, and git rid of that berkerlosis."

A week later Jake stumbled in, more woebegone than ever.

" 'Taint no use, Mandy, nary bit of use. I ain't never gwine get well. De doctors sav dis morning I got two berkerlosis."

—Magnolia Oil News.

Herm: "Where did you get that black eye?"

Eddie: "You remember that pretty girl who said she was a widow?"

Herm: "Yes."

Eddie: "Well, she wasn't."

—The Pure Oil News.

* * *

A couple of neighbors were discussing their respective husbands.

"Is your husband generous with spending money?" asked Mrs. Slab.

"I guess he must be," returned Mrs. Drab tartly. "I never see any."

—Standard Gasoline Co. Booster.

* * *

"I notice you have a new fraternity pin, but why are you wearing it on the right side?"

"Oh, that's just to signify a change of heart."

—Stanolind Record.

* * *

While a traveling man was waiting for an opportunity to show his samples to a merchant in a little back woods town in Missouri, a customer came in and bought a couple of nightshirts. Afterwards a long lanky lumberman with his trousers stuffed in his boots said to the merchant:

"What was them 'er that feller bot?"

"Nightshirts. Can I sell you one or two?"

"Naup, I reckon not," said the Missourian. "I don't set around o' nights."—*The Marion Line*

* * *

"Do your hens 'sit' or 'set'?" asked the summer tourist of the farmer's wife.

"I'm not concerned about that," said she. "When the hens cackle what I want to know is, are they laying or lying."

—Stanolind Record.

* * *

Captain (to gunner)—"See that man on the bridge five miles away?"

Gunner—"Ay, ay, sir!"

Captain—"Let him have a twelve-inch in the eye."

Gunner—"Which eye, Sir?"—*The Marion Line*

* * *

Altogether

Parson Johnson—De choir will now sing, "I'm Glad Salvation's Free," while Deacon Ketcham passes de hat. De congregation will please 'member while salvation am free, we hab to pay de choir foh singin' about it. All please contribute accordn' to yo' means an' not yo' meanness.

—Pure Oil News.

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INDEX TO ARTICLES

Selected Bibliography on Petroleum Technology

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Woodruff, E. G. and Cooper, C. L. — **305.111.32**

"Geology of Rogers county"

Oklahoma Geological Survey Bulletin 40-U, March, 1928, 24 p., 30 cents.

Some of the earliest development in Oklahoma was in Rogers county. The northern part of the county contains the southern extension of the great Nowata shallow sand field, now chiefly celebrated because of the excellent results obtained by repressuring oil sand. The authors describe structural conditions in the county and the producing sands, of which the Bartlesville is prominent. A geologic map of the county is included.

Chatfield, J. C. — **741.31**

"Fuel Costs Halved on Old Shell Still Battery at Bolene Plant"

National Petroleum News, May 2, 1928, pp. 81-83.

Nine small shell stills are increased from a capacity of 675 barrels a day to 4000 barrels a day by comparatively small and inexpensive changes, such as installation of dutch oven furnaces, putting preheating coils in the stack so that crude coming to the stills picks up waste heat, and other devices, including improved method of operating Jenkins cracking still.

Butts, Charles — **305.111.19**

"Oil and Gas Possibilities at Early Grove, Virginia"

Virginia Geological Survey Bulletin 27, issued in 1927, 18 p.

The region described is in Scott county, which is in the southwest part of the state. Structural conditions cause the author to believe that the chance for oil is better in the area covered by the report than elsewhere in that part of Virginia, although he finds the carbon ratio of coal in the region is somewhat above the maximum considered by David White to be compatible with the occurrence of oil in the Appalachian region.

Truesdell, Paul — **753.**

"Good Products at Low Cost from any Crude Available" Article 2

National Petroleum News, April 18, 1928, pp. 61-63.

Methods and equipment used in the manufacturing of lubricating oils at the plant of the Marland Refining Co., Ponca City, Okla., are described. Illustrated.

Chatfield, J. C. — **914.12**

"Re-Pressuring Oil Sands in Old Fields Causing Gasoline Plants to Close"

National Petroleum News, April 11, 1928, p. 51.

Gasoline plants in the Nowata-Chelsea district of northern Oklahoma are closing down because of the low price natural gasoline commands and also due to the complications caused by the increasing use of natural gas for restoring pressure on the oil sand to promote greater recovery of oil.

Rue, H. P. — **721.**

"Careful Fractionation Can Reduce Cost of Treating Cracked Gasoline"

National Petroleum News, April 25, 1928, pp. 48-50.

Proper operation of bubble towers working on vapors of cracked distillates being rerun will reduce, at least to some extent, the content of gum-forming constituents in the resulting gasoline, the author's experiments at the Bureau of Mines station at Bartlesville have shown. Under certain conditions the gum is entirely removed from all but a small portion of the gasoline, so that the volume of the product requiring chemical treatment is very small. Possibilities exist for reducing treating cost by further study of this method.

Burrell George A. (Consulting Chemical Engineer) — **290.**

"Composition of Petroleum and Its Products"

Industrial and Engineering Chemistry, June, 1928, Vol. 20, No. 6, pp. 602-608.

This article discusses present knowledge of physical and chemical properties and characteristics of various petroleum fractions and urges the need for further research work. The author concludes: "In the writer's opinion the research problem of primary importance in the whole petroleum field and one that is still largely unsolved, has to do with the isolation and identification of the compounds present in petroleum, both in the crude oil and in the distillates more or less altered by destructive distillation."

Refinery - Tank Wagon Markets

National Petroleum News

Gasoline and Kerosene Purchases Made By Exporters in Mid-Continent

Staff Special
TULSA, June 16

CONTINUED good domestic demand combined with export buying brought about further increases in gasoline prices in the Mid-Continent this week. Refiners in all areas reported they were shipping the limit on jobbers' contracts which shipments, coupled with a good spot demand, kept their shipments well ahead of production. Export buying was confined to Texas although inquiries were received in Arkansas and Louisiana.

Kerosene fell off in price in all areas, as stocks accumulated and demand decreased. There was some export buying. Gas oils, distillate and fuel oils also decreased in price but June 16 were holding fairly steady.

Neutrals oils and cylinder stocks, while demand was reported only fair, continued to bring prices of the last two weeks. Wax was scarce and prices advanced.

Gasolines

Exporters were inquiring for gasoline June 11, but no sales were reported made until the middle of the week. June 14 two large companies bought a total of 750,000 gallons of 64-66, 375 e.p. gasoline in Texas paying 8.125 cents, their offering price earlier in the week.

Rumors were heard at the middle of the week that exporters were seeking 58-60 U. S. Motor for export. Their price was 7.625 cents which was 0.25 of a cent below the low domestic market and no sales were made.

Price advances were noted all over the Mid-Continent with the greatest boost showing in Kansas where refiners raised their price of U. S. Motor from 7.875 cents June 11, to 8 and 8.125 cents June 16. Other grades were advanced correspondingly.

In Oklahoma several refiners. reported June 13, that they also had raised their quotations on all grades of gasoline an 0.125 cent. One refiner was obtaining 8 cents a gallon for some of his U. S. Motor, the highest the price has been for many months. This company's price has been in effect for about 10 days and June 16, one or two other refiners reported sales at 8 cents.

Other gasolines also moved well, especially those of low gravity with an end point of 450 degrees. All refiners who make this grade, report a good demand for it. Several reported they were able, in some instances, to obtain prices within 0.125 cent of U. S. Motor. June 15 one refiner sold around 50 cars of 58-60, 450 e.p. gasoline at 7.50 cents.

Various reports were heard on blended gasolines, one blender in Oklahoma saying he was having no difficulty in obtaining 7.50 cents for his goods while another, operating both in Oklahoma and Texas, asserted that demand was slow in Oklahoma and that he was unable to obtain better than 7.25 cents. In Texas some blended gasoline was bringing prices paid for U. S. Motor.

Arkansas prices of U. S. Motor moved up 0.25 of a cent June 16 to 8.50 cents. Refiners in that district continue to report they are well sold up with one or two reporting they were behind on shipments. An export inquiry was in the market June 14 for 64-66, 375 e.p. gasoline on which the purchaser was quoted 8.75 cents for immediate shipment. As far as could be learned the business was not placed.

Louisiana and Texas prices remained unchanged on U. S. Motor over the week, the Texas price being 7.875 to 8 cents June 16, and the Louisiana price being 8.25 cents.

Natural Gasolines

Prices 0.25 to 0.75 cent lower were in effect for natural gasoline June 16, following a let-up on demand of 10 days previously. Most sellers reported there was little domestic or export demand for any grade. A and AA were being freely offered. B, BB and C were not so plentiful as the other two grades, but were forced down by lower AA prices. Several sellers, after the spread between the grades had narrowed, were shipping BB on C orders, and the same was true of AA which was being shipped on orders for the other two grades June 16, when all prices were at a minimum of 5.50 cents. One large company, who during the heavy buying of several days ago purchased between 200 and 300 cars of AA, came into the market June 14, for 25 cars of sweet grade AA and again on the next day for 50 cars of the same material. The goods was purchased at 5.875 cents for the first order and 6 cents for the second, the latter being contracted for over the remainder of June, shipments to start June 20.

June 16 a large manufacturer who also does some marketing business, said he had accepted an order for 20 cars of grade BB and that he was having a hard time finding material. He made one purchase of 10 cars of sour BB at 5.50 cents. Grade C, while the demand was not heavy was selling at prices A and AA were bringing for the reason that very little of it was available.

Kerosenes

Kerosenes were reported in less demand in all parts of the Mid-Continent and price reductions were made in Oklahoma and Louisiana. June 11, in Oklahoma, 41-43 w.w. grade was selling mostly at 4.75 to 4.875 cents with a few sales reporting at 4.625. The Louisiana price fell from 5.75 cents June 11, to 5.50 cents June 12. The Texas price was unchanged over the week at 4.75 to 4.875 cents. The Arkansas price was the same at 5.50 cents with Kansas also unchanged at 5.50 to 5.75 cents. Although there were no price changes in these districts refiners reported that demand had slackened.

Demand for kerosenes in Oklahoma had been only fair for two weeks but apparently refiners were endeavoring to hold their price because on June 11, while there were only a few sales made, the bulk of them were made at 5 to 5.125 cents, with an occasional transaction of only a car or so reported below those

Refinery Markets on LightOils and Lubricants

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(These Refinery Prices compiled in the OIL PRICE HANDBOOK for a whole year)

GASOLINE AND NAPHTHA

PENNSYLVANIA	Prices June 18	Prices June 11	Prices June 4
52-54 Naphtha	10.00 –10.50	9.75 –10.50	10.00
54-56 Naphtha	10.00 –10.50	10.00 –10.50	10.00 –10.50
58-60 U.S. Motor 437 e.p.	10.50 –11.00	10.50 –11.00	10.50 –11.00
60-62 400-410 e.p. gasoline	11.00 –11.50	11.00 –11.50	11.00 –11.50
64-66 390 e.p. gasoline	11.25 –11.75	11.25 –11.50	11.25 –11.50
68-70 Str.-run gas. 350-360 e.p.	11.50 –12.50	11.50 –12.25	11.50 –12.25
OKLAHOMA			
48-50 450 e.p. naphtha	†7.25 – 7.375	†7.25 – 7.375	†7.125– 7.25
50-52 450 e.p. naphtha	†7.25 – 7.375	†7.25 – 7.375	†7.125– 7.25
56-58 450 e.p. gasoline	7.375	7.375	7.125– 7.25
58-60 450 e.p. gasoline	7.50	7.50	7.25 – 7.375
64-66 390 e.p. gasoline	8.00 – 8.125	7.875– 8.00	7.75 – 7.875
68-70 350-360 e.p. gasoline	8.25 – 8.375	8.25 – 8.375	8.125– 8.25
OKLAHOMA (Weighted Average Prices)			
58-60 U.S. Motor, 437 e.p.	7.7904	7.7926	7.6501
60-62 437 e.p. gasoline	7.8125	7.8750	7.7955
60-62 400 e.p. gasoline	8.0000	8.0000	7.9553
64-66 375 e.p. gasoline	8.1250	8.1875	8.0625

Above are weighted average prices, current week's prices being effective on Saturday, instead of Monday, Saturday being the last day on which weighted averages are available for publication in this table. Weighted average prices for the current Monday are published on page 53 of this issue. The two previous week's prices shown are corrected to show Monday's prices, effective on the dates shown at the top of the columns.

KANSAS (F. O. B. refinery Kansas destination)			
58-60 U.S. Motor 437 e.p.	8.00 – 8.125	7.875	7.75 – 7.875
60-62 400 e.p. gasoline	8.125– 8.25	8.00 – 8.125	8.00
64-66 375 e.p. gasoline	8.25 – 8.375	8.125– 8.375	8.00 – 8.125
NORTH TEXAS			
48-52 450 e.p. naphtha	†7.25	†7.25	†7.25
56-58 450 e.p. gasoline	†7.375– 7.50	†7.375– 7.50	†7.25 – 7.375
58-60 450 e.p. gasoline	†7.50	†7.50	†7.375
58-60 U.S. Motor 437 e.p.	7.875– 8.00	7.75 – 7.875	7.75
60-62 400 e.p. gasoline	8.00 – 8.125	7.875– 8.00	7.875
64-66 390 e.p. gasoline	8.125	8.00 – 8.125	8.00
64-66 375 e.p. gasoline	8.125– 8.25	8.125– 8.25	8.125– 8.25
68-70 350-360 e.p. gasoline	8.25 – 8.375	8.25 – 8.375	8.25 – 8.375
NORTH LOUISIANA (N. La., Ark. and Miss. destination)			
58-60 U.S. Motor gasoline	8.25	8.25	8.00
ARKANSAS (Arkansas destination only)			
56-58 450 e.p. gasoline	7.625– 7.75	7.625	7.50
58-60 450 e.p. gasoline	7.75 – 7.875	7.75	7.50 – 7.625
58-60 U.S. Motor 437 e.p.	8.25 – 8.50	8.25	8.25
‡CALIFORNIA			
54-58 U.S. Motor 437 e.p.	8.00 –11.50	8.00 –11.50	8.00 –12.00
58-61 U.S. Motor 437 e.p.	10.00 –13.00	10.00 –13.00	10.00 –13.00
42-45 Eng. dis. 445-480 e.p.	6.50 – 7.00	6.50 – 7.00	6.50 – 7.00

‡3c tax to be added to California gasoline prices if used in state.

NATURAL GASOLINE

(Note: End point of all grades, not over 375 F. Corrosion test adopted Oct. 1, 1927; A.S.T.M. Method D130-27T).

OKLAHOMA			
Grade AA, 80-87.9, 90% Recovery	5.75	†6.00 – 6.25	†5.75 – 6.25
Grade A, 72-79.9, 90% Recovery	5.75	†6.00 – 6.25	†5.75 – 6.25
Grade BB, 84-92, 85% Recovery	5.75	†5.75 – 6.00	†5 25 – 5.375
Grade B, 76-83.9, 85% Recovery	5.75	†5.75 – 6.00	†5.25 – 5.375
Grade C, 80-92, 78% Recovery	5.75	†5.75	†5.25 – 5.375
NORTH TEXAS (F. O. B. Breckenridge)			
Grade AA, 80-87.9, 90% Recovery	5.75	†6.00 – 6.25	†5.75 – 6.25
Grade A, 72-79.9, 90% Recovery	5.75	†6.00 – 6.25	†5.75 – 6.25
Grade BB, 84-92, 85% Recovery	5.75	†5.75 – 6.00	†5.25 – 5.375
Grade B, 76-83.9, 85% Recovery	5.75	†5.75 – 6.00	†5.25 – 5.375
Grade C, 80-92 78% Recovery	5.75	†5.75	†5.25 – 5.375
NORTH LOUISIANA (F. O. B. Monroe District)			
Grade AA	†6.25	†6.50 – 6.75	†6.25
Grade BB	†5.00 – 6.25	†6 00 – 6.25	†5.50 – 5.75
Grade C	†6.00 – 6.25	†5.75 – 6.00	†5.50 – 5.75
CALIFORNIA			
75-85, 375-390 e.p. blend	6.00 – 7.50	7.00 – 8.00	7.50 – 8.00

MOTOR FUEL BLENDS

OKLAHOMA			
64-66 Blend 437 e.p.	†7.375– 7.50	†7.25 – 7.50	†7.25

BURNING OILS

PENNSYLVANIA			
45 w.w. kerosene	6.50 – 7.00	6.50 – 7.25	6.75 – 7.25
46 w.w. kerosene	6.875– 7.50	6.875– 7.50	7.00 – 7.75
47 w.w. kerosene	7.25 – 7.50	7.25 – 7.50	7.50 – 8.00
300 mineral seal	7.50 – 7.75	7.50 – 7.75	7.50 – 7.75

OKLAHOMA	Prices June 18	Prices June 11	Prices June 4
41-43 w.w. kerosene	4.75 – 5.00	5.00 – 5.125	5.00 – 5.25
42-44 w.w. kerosene	5.00 – 5.25	5.375– 5.50	5.375– 5.50
KANSAS (F. O. B. refinery Kansas destination)			
41-43 w.w. kerosene	5.50	5.50 – 5.75	5.50 – 5.75
42-44 w.w. kerosene	5.75	5.75 – 6.00	5.75 – 6.00
NORTH TEXAS			
40-42 w.w. kerosene	†4.50 – 4.625	†4.50 – 4.625	†4.625– 4.75
41-43 w.w. kerosene	†4.75 – 4.875	†4.75 – 4.875	†4.875– 5.125
NORTH LOUISIANA (N. La. Ark. and Miss. destination)			
41-43 w.w. kerosene	5.50	5.75	5.75
ARKANSAS (Arkansas destination only)			
42-44 kerosene	5.50	5.50	5.75
CALIFORNIA			
38-40 w.w. kerosene	5.00 – 5.50	5.00 – 5.50	5.00 – 5.50

NEUTRAL OIL

PENNSYLVANIA Vis.		(Viscosity at 70°F.)	
200 No. 3 Assoc. Filt.	33.00 –35.00	33.50 –35.00	33.50 –35.00
180 No. 3 Assoc. Filt.	31.50 –33.00	31.50 –33.00	31.50 –33.00
150 No. 3 Assoc. Filt.	27.50 –29.00	27.50 –29.00	27.50 –29.00
	(Non Viscous)		
34 Grav. 330-340 Flash	7.75 – 9.00	7.75 – 9.00	7.75 – 9.00
36 Min. Neut. 300-305 Flash	7.00 – 8.50	6.75 – 8.50	6.75 – 8.50
OKLAHOMA Vis. Color		(Viscosity at 100°F.)	
100—No. 2	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50
150—No. 3	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
150—No. 4	8.00 – 8.50	8.00 – 8.50	8.00 – 8.50
180—No. 3	9.00 –10.00	9.00 –10.00	9.00 –10.00
180—No. 4	9.50 – 9.75	9.50 – 9.75	9.50 – 9.75
180—No. 5	9.25 – 9.75	9.25 – 9.75	9.25 – 9.75
200—No. 3	9.625–11.00	9.625–11.00	9.625–11.00
200—No. 4	9.50 –10.75	9.50 –10.75	9.50 –10.75
200—No. 5	9.00 –10.50	9.00 –10.50	9.00 –10.50
220—No. 3	12.50 –13.50	12.50 –13.50	12.50 –13.50
220—No. 4	12.25 –12.50	12.25 –12.50	12.25 –12.50
220—No. 5	11.50 –12.00	11.50 –12.00	11.50 –12.00
240—No. 3	13.50 –14.00	13.50 –14.00	13.50 –14.00
240—No. 4	13.25 –13.50	13.25 –13.50	13.25 –13.50
240—No. 5	12.00 –13.00	12.00 –13.00	12.00 –13.00
280—No. 3	15.50 –16.50	15.50 –16.50	15.50 –16.50
280—No. 4	15.25	15.25	15.25
280—No. 5	14.00 –15.00	14.00 –15.00	14.00 –15.00
300—No. 5-6	17.00	17.00	17.00
GULF COASTAL Vis. Color		(Viscosity at 100°F., pour test 0)	
100—No. 2 Unfilt. Pale	6.75 – 7.25	6.50 – 7.00	6.50 – 7.00
200—No. 3 Unfilt. Pale	9.50 –10.25	9.50 –10.25	9.50 –10.25
300—No. 3 Unfilt. Pale	10.75 –11.50	10.50 –11.25	10.50 –11.25
500—No. 3½ Unfilt. Pale	12.75 –13.50	12.50 –13.25	12.50 –13.25
750—No. 4 Unfilt. Pale	15.00 –16.00	14.50 –15.50	14.50 –15.50
200—No. 5½ Red Oil	8.00 – 8.50	7.50 – 8.25	7.50 – 8.25
300—No. 5½ Red Oil	9.00 – 9.50	8.75 – 9.25	8.75 – 9.25
500—No. 6 Red Oil	10.50 –11.00	10.00 –10.50	10.00 –10.50
750—No. 6 Red Oil	13.00 –14.00	12.75 –13.50	12.75 –13.50
CALIFORNIA Vis. Color		(Viscosity at 100°F.)	
100—No. 3	9.50 –10.00	9.50 –10.00	9.50 –10.00
200—No. 3	11.50 –12.00	11.50 –12.00	11.50 –12.00
300—No. 3	13.00 –13.50	13.00 –13.50	13.00 –13.50
450—No. 3	15.50 –16.00	15.50 –16.00	15.50 –16.00
550—No. 3	16.50 –17.00	16.50 –17.00	16.50 –17.00
600—No. 3	17.00 –17.50	17.00 –17.50	17.00 –17.50
200—No. 5	11.00 –11.50	11.00 –11.50	11.00 –11.50
300—No. 5	12.00 –12.50	12.00 –12.50	12.00 –12.50
400—No. 5	14.00 –14.50	14.00 –14.50	14.00 –14.50
500—No. 5	15.00 –15.50	15.00 –15.50	15.00 –15.50
600—No. 5	16.00 –16.50	16.00 –16.50	16.00 –16.50
700—No. 7	18.00 –18.50	18.00 –18.50	18.00 –18.50

CYLINDER STOCKS

****OKLAHOMA**			
190-200 Vis. at 210° Brt. St.	31.00 –32.00	31.00 –32.00	31.00 –32.00
150-160 Vis. at 210° Brt. St.	21.50 –24.00	21.50 –24.00	21.50 –24.00
600 E St. 140-150 Vis.-210°	17.00 –18.00	17.00 –18.00	17.00 –18.00
600 St. Ref. Olive Green	8.50 –10.00	8.50 –10.00	8.50 –10.00
600 St. Ref. Dark Green	6.00 – 8.00	6.00 – 8.00	6.00 – 8.00
Black Oil	5.00	5.00	5.00
PENNSYLVANIA	(1-inch Immersion Test)		
600 Steam Refined	11.00 –12.00	10.50 –11.75	10.50 –11.75
650 Steam Refined	13.00 –15.00	12.50 –15.00	12.50 –15.00
600 Flash	17.00 –20.00	16.00 –20.00	16.00 –20.00
625 Flash	26.00 –29.00	25.00 –29.00	25.00 –29.00
600 Warren E	16.50 –17.50	16.00 –17.50	16.00 –17.50
600 Oil City E	15.50 –17.00	15.50 –17.00	15.50 –17.00
600 D Filtered	22.00 –26.00	22.00 –26.00	22.00 –26.00
Cold Test Stock, 40-50 p. p., 140-150 vis. at 210° 540-550 flash, No. 8 color	35.00	34.00	31.00
40-50 p.p., 140-150 vis. at 210°, 540-550 flash, No. 6-6½ color diluted	33.00	32.00	29.00

(Note—Prices of total immersion test goods average 1 to 3 cents per gallon gher)

†Prices nominal ††Only one refiner quoting *Quotations only **Represents both sales and quotations

prices. More sellers fell below the 5-cent price June 13 and 14, resulting in the 4.75-cent low June 16.

Exporters purchased approximately 500,000 gallons of 41-43 prime white kerosene in Texas at 4.50 cents June 14, which was a 0.25 cent below the low domestic market for 41-43 water white kerosene.

Gas Oil and Distillate

Competition from other areas has had a depressing effect on Oklahoma gas oil prices, and June 16 sellers were taking an 0.125 cent less than they were June 11. Some 32-36 dark colored oil was reported moved on a Group 3 freight rate June 14 at 2.25 cents, which was then 0.25 cent below the low Oklahoma price. June 14 reductions were made in prices of Oklahoma and 32-36 dark gas oil June 16 was selling at 2.375 to 2.625 cents a gallon, and 32-36 straw colored material at 2.50 to 2.75 cents.

Refiners in other districts reported they had encountered low quotations made on a Group 3 basis, but June 16 none had lowered his price.

Distillate was unchanged in price throughout the territory, but refiners reported there was little demand. Most refiners have cut production all that is possible, running what material is cut into storage.

Fuel Oils

Fuel oils were cheaper for the fourth consecutive week, the larger reductions being made in Oklahoma and Texas where refiners are forced to meet competition from the west Texas fields. All grades of fuels were at lower prices by 2.50 cents a barrel June 16 than they were at the beginning of the week, and Texas 24-26 fuel had fallen to a new low of 62.5 cents a barrel with some reported moving at 60 cents. Oklahoma refiners succeeded in holding their price of 65 cents for low gravity goods, although unconfirmed reports of fuel oil for resale at 60 and 62.5 cents were heard.

Neutral Oils, Cylinder Stocks, Wax

No changes were reported in neutral oils and cylinder stocks, the prices which prevailed June 9, still being in effect June 16. Most refiners reported a good spot demand, and several said they were having no trouble in getting buyers to take out their contract requirements.

Wax was virtually unavailable most makers saying they were sold up. One refiner stated he was sold up for the remainder of June and that his idea of the price for July was 4.25 cents which seemed to the majority of refiners' opinions.

Hickok Oil Corp.—$1,500,000 of 6 per cent sinking fund debentures issued at par through Central Trust Co., Chicago.

Pan American Petroleum & Transport Co.—All directors reelected at annual meeting.

Export Gasoline and Kerosene Prices Hold in Los Angeles

Staff Special
LOS ANGELES, June 16

PRICES of products except gasoline for export and kerosene were sluggish this week because of the demoralized condition of the Los Angeles market and the over supply of natural gasoline.

Export gasoline is still held at 7.75 to 8 cents, with little obtainable at less than 8 cents. Major refiners are holding their gasoline for higher prices, but they are somewhat baffled by the increasing tanker rates. Owners of tankers are asking from 90 cents to $1 a barrel for gasoline to East Coast points, an advance of 15 to 25 cents a barrel in less than 60 days.

Fuel oil is holding its own fairly well, with no cheap stuff on the market. California refiners apparently feel that it is better to hold their stocks of fuel than to sell in competition with the South American product. Tankers to move fuel or crude are easier to obtain with charges ranging from 50 cents to 58 cents to East Coast.

Natural gasoline is plentiful and a few cars are selling each week as low as 6 cents, with rumors of this low price being shaved slightly. A major portion of the natural gasoline production in the state is sold under long time contracts at around 7.50 cents but with the great increase in production of natural gas at Long Beach and increased capacity of plants, the supply is larger than the normal demand.

Because of so much natural gasoline, some Independent refiners are using more natural gasoline in their motor fuel than is ordinarily used. Most anything goes as long as the motor fuel can stand a 95 per cent recovery test. Gasoline with a gravity as high as 65 to 70 degrees is not unusual at the cut price stations.

The so-called tank wagon price war officially is over insofar as the major refiners are concerned, but the resellers are being approached from all quarters with new offers and all kinds of contracts. One Independent refiner was serving a fairly large service station at 7 cents under the official service station price, but without a contract. Another Independent came along and signed up this customer on a proposition slightly better. In the eastern and southern parts of Los Angeles 14-cent signs are appearing, and generally these low price stations gather in 75 per cent of the business in their localities.

Independent refiners are continuing the fight for gallonage, and contracts are being offered ranging from 6 to 7.50 under the posted service station price, but practically no service buying under these contracts are selling at the official price. Most of them are selling at 18.50 cents, 2 cents under the service station price, while others are selling at six gallons for $1, six gallons for 95 cents and a few are selling at 14 cents a gallon straight.

It is understood that most of the stations selling at 14 cents are buying gasoline at the refinery and having it hauled in tank trucks to their station. This indicates that these stations are buying at 8 to 8.50 cents at the refinery. The tax of 3 cents must be paid, cartage is around 0.50 to 0.75 cents and the service station operator then has left a profit of 2 to 2.50 cents a gallon. One station in the suburbs is selling more than 2000 gallons a day.

It is feared that there will be a break in the official service station price.

The kerosene price is unchanged. Uncracked gasoline is extremely scarce, with cracked stuff available at old prices. Gas oil is unchanged in price, while diesel is unmolested by the unsettled gasoline price situation.

* * *

Los Angeles Shipments

LOS ANGELES, June 15.—Fifteen tankers leaving Los Angeles Harbor in the week ended June 9 carried total of 1,047,718 barrels of petroleum products, a daily average of 149,674 barrels, compared with previous week's total of 1,470,488 barrels, a daily average of 210,070 barrels.

Total movement included 3247 barrels of crude, 490,986 barrels of fuel, 414,481 barrels of gasoline, 50,769 barrels of diesel and 88,235 barrels of kerosene.

Pacific foreign trade absorbed 385,189 barrels of fuel, 3247 barrels of crude, 88,993 barrels of gasoline, 50,769 barrels of diesel and 88,235 barrels of kerosene.

Atlantic domestic points drew gasoline only, amounting to 325,488 barrels. Atlantic foreign shipments consisted of 105,797 barrels of fuel.

LOS ANGELES, June 14.—Joe Toplitzky, Los Angeles capitalist and real estate operator, has been elected a director of the Richfield Oil Co. succeeding C. A. Madary. Mr. Madary will continue as secretary of the company.

B. P. Cooper of the Houston marketing firm known as the Cooper Petroleum Co., has returned from a tour of southeastern states.

Refinery Markets on Wax and Heavy Oil Products

Prices given below are in cents per gallon, F. O. B. refinery, except where $ is shown

(For quick reference to Refinery Prices, get the OIL PRICE HANDBOOK, published annually)

WAX

PENNSYLVANIA	Prices June 18	Prices June 11	Prices June 4
Per pound, New York			
122-124 white crude scale	4.375– 4.50	4.25 – 4.50	4.25 – 4.50
124-126 white crude scale	4.50	4.25 – 4.50	4.25 – 4.50
OKLAHOMA			
**124-126 White Crude Scale	4.25	3.875– 4.125	3.75 – 4.00
CALIFORNIA			
White crude scale, per pound, ton lots	6.00 – 6.50	6.00 – 6.50	6.00 – 6.50

FUEL OIL

PENNSYLVANIA			
36-40 fuel oil	5.00 – 5.25	5.00 – 5.50	5.00 – 5.50
30-34 fuel oil	4.75 – 5.00	4.75 – 5.125	5.00 – 5.125
28-32 fuel oil	4.50 – 5.00	4.50 – 5.00	4.50 – 5.00
OKLAHOMA			
38-40 straw distillate	3.00 –3.125	3.00 – 3.125	3.00 – 3.125
36-38 straw distillate	3.00	3.00	3.00
32-36 gas oil, straw	†2.50 – 2.75	†2.625– 2.75	†2.625– 2.75
32-36 dark gas oil	†2.375–2.625	2.625	2.625
28-30 fuel oil (in bbls.)	$0.85 – 0.875	$0.875– 0.90	$0.90 – 0.925
26-28 fuel oil (in bbls.)	$0.775– 0.825	$0.80 – 0.825	$0.825– 0.85
24-26 fuel oil (in bbls.)	**$0.70– 0.75	**$0.725– 0.75	**$0.75
22-26 fuel oil (in bbls.)	**$0.65– 0.70	**$0.675– 0.70	**$0.70– 0.725
18-22 fuel oil (in bbls.)	**$0.65– 0.70	**$0.675– 0.70	**$0.70
16-18 fuel oil (in bbls.)	**$0.65– 0.675	**$0.65 –0.675	**$0.675– 0.70
14-16 fuel oil (in bbls.)	**$0.65– 0.675	**$0.65 –0.675	**$0.675– 0.70
KANSAS (F. O. B. refinery Kansas destination.)			
38-40 straw distillate	3.25 –3.375	3.25 – 3.50	3.25 – 3.50
36-38 straw distillate	3.00	3.00	3.00
32-36 gas oil	2.625– 2.75	2.625– 2.75	2.625– 2.75
24-26 fuel oil	*$0.825– 0.875	*$0.875– 0.90	$0.875– 0.90
18-22 fuel oil	*$0.725– 0.75	*$0.75 – 0.775	$0.75 – 0.775
NORTH TEXAS			
38-40 straw distillate	2.875– 3.00	2.875– 3.00	2.875– 3.00
32-36 gas oil, cracked	2.25 – 2.375	2.375	2.375
32-36 gas oil, uncracked	2.25 – 2.375	2.375	2.375
24-26 fuel oil (in bbls.)	$0.625– 0.65	$0.65	$0.65

GULF COASTAL	Prices June 18	Prices June 11	Prices June 4
Fuel (in bbls.)	$1.30 –$1.35	$1.30 –$1.35	$1.30 –$1.35
Gas oil	4.25 –4.375	4.25 – 4.375	4.25 – 4.375
NORTH LOUISIANA (N. La., Ark. and Miss. destination)			
32-36 gas oil, dark	2.625 –2.875	2.625– 2.875	2.625– 2.875
32-36 gas oil, straw	2.75 – 3.00	2.75 – 3.00	2.75 – 3.00
16-20 fuel oil (in bbls.)	$0.80 – 0.85	$0.80 – 0.85	$0.80 – 0.85
ARKANSAS (Arkansas destination only)			
32-36 gas oil, straw	3.00 – 3.25	3.00 – 3.25	3.00 – 3.25
32-36 gas oil	2.75 – 3.00	2.75 – 3.00	2.75 – 3.00
28-32 gas oil	2.75	2.75	2.75
Road Oil	$1.15	$1.15	$1.15
CALIFORNIA (F. O. B. San Joaquin Valley. At San Francisco, 4c per bbl. more)			
14-18 fuel oil (in bbls.)	$0.70 –$0.85	$0.70 –$0.85	$0.70 –$0.85
14-18 Bunker oil (in bbls.)	$0.80 –$1.00	$0.80 –$1.00	$0.80 –$1.00
30-34 gas oil (in bbls.)	$0.95 –$1.10	$0.95 –$1.10	$0.95 –$1.10
27 Plus Diesel oil (in bbls.)	$0.90 –$1.10	$0.90 –$1.00	$0.90 –$1.00

PETROLATUMS

PENNSYLVANIA (In barrels, carload lots, f.o.b. refinery. In tank cars ½c to ¾c per pound less.)			
Snow White	8.25 – 8.375	8.00 – 8.25	8.00 – 8.25
Lily White	7.25 – 7.375	7.00 – 7.25	7.00 – 7.25
Cream White	6.25 – 6.375	6.00 – 6.25	6.00 – 6.25
Blonde	‡	‡	‡
Light Amber	3.25 – 3.375	3.00 – 3.25	3.00 – 3.25
Amber	3.00 – 3.125	3.00	3.00
Red	2.75 – 2.875	2.75	2.75
Green No. 5 color	‡	‡	‡

‡No refiner quoting.

PETROLEUM COKE

****OKLAHOMA**

(Per ton in car lots)

Lump	$4.50 – 5.00	$4.50 –$5.00	$4.50 –$5.00
Still run	2.75 – 3.00	$2.75 –$3.00	$2.75 –$3.00
Breeze	$1.75 – 2.00	$1.75 –$2.00	$1.75 –$2.00

†Prices Nominal ††Only One Refiner Quoting *Quotations only

**Represents Both Sales and Quotations

Wax Prices Hold Steady Against Slack Demand

NEW YORK, June 16.—Foreign wax buying fell off considerably during the past week but prices both in New Orleans and New York markets held up fairly well. Quotations of major dealers for white crude scale and fully refined waxes were generally the same as a week ago. Most suppliers reported being well sold up for June and interest this week tended more toward the July market.

Several companies refused to quote for July, but where quotations could be obtained they were largely at the top prices of current market ranges. One large refiner of white crude scale said his company was far from an uncomfortable position in regard to stocks and therefore he was in no hurry to commit himself for futures. Much the same report was made by other large suppliers.

For the most part, 124-126 A.m.p. white crude scale was quoted at 4.50 cents a pound in the New York market, although it was generally admitted by sellers that only a small volume of business has been taken at this price. It was asserted that were any additional scale available for June shipment it might command this price.

Contrary reports were heard in other quarters, however. A small lot of scale, a resale agent said, was being offered late this week at 4.25 cents a pound with no takers. The best bid against this price was 4.125 cents.

Fully refined waxes were more active at New Orleans than was white crude scale. The 125-127 A.m.p. fully refined was in particularly good demand and several sales at 4.75 cents were reported. Scale was quoted largely at 4.125 to 4.375 cents.

Tanker Rates

NEW YORK, June 18.—Approximate tanker freight rates in the following trades are, to Continental ports, in shillings per ton of 2240 pounds, British Sterling; to American ports, cents per barrels:

	Crude &/or Fuel	Refined Oil
Calif. to U.K. or Continental ports*	28/	32/6
Gulf to U.K. or Continental ports*	16/6-	18/6
North Atlantic to U.K. or Continental ports*	13/6	15/6
Calif. to North Atlantic ports (not E. of N. Y.)	52c	85c
**Gulf to North Atlantic ports (not E. of N. Y.)	18c	35c

*Continental ports in the range between Bordeaux and Hamburg, both inclusive.

**For Venezuela loading 1c per bbl. additional. For Tampico loading, 4c per bbl. additional.

Week's Price Changes Tank Wagon Markets

Gasoline Changes

Standard of New York—S.s. price of gasoline at Syracuse should have been published as 19 cents, instead of 20 cents, since May 17. No change was made on May 17 when posted tank wagon was raised 1 cent, to 17 cents.

Standard of Nebraska—T.w. and s.s. prices gasoline advanced ½ cent, Scottsbluff, to 17.75 and 19.75 cents respectively, including 2 cent state tax, **June 8.** S.s. price gasoline at North Platte should have been 19.5 cents since **Apr. 21**, instead of 18.5 cents, as published in past issues of National Petroleum News.

Magnolia Petroleum—T.w. and s.s. prices gasoline advanced 1 cent, through Oklahoma, except Muskogee s.s. advanced 2 cents, **June 12.**

* * *

Kerosene Changes

Atlantic Refining—Kerosene price advanced 1 cent, Pennsylvania, making t.w. price 14 cents generally, **June 14.**

Standard of Nebraska—Kerosene price advanced ¼ cent, Scottsbluff, to 13.25 cents, **June 8.**

Tank Wagon, Service Station Markets for Gasoline and Kerosene

(OIL PRICE HANDBOOK has t.w. and s.s. markets for 1927, 1926, 1925, 1924 arranged for quick reference)

These Prices in Effect June 18, 1928, as Posted by Principal Marketing Companies

S.O. NEW JERSEY TERRITORY

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
Atlantic City, N. J.	16	2	18	20	14
Newark, N. J.	16	2	18	20	14
Annapolis, Md.	16	4	20	23	14
Baltimore, Md.	16	4	20	23	12
Cumberland, Md.	16	4	20	23	14
Washington, D. C.	16	2	18	21	14
Danville, Va.	16	5	21	*	14
Norfolk, Va.	16	5	21	21	14
Richmond, Va.	16	5	21	24	14
Roanoke, Va.	16	5	21	24	14
Petersburg, Va.	16	5	21	24	14
Charleston, W. Va.	16	4	20	23	14
Keyser, W. Va.	16	4	20	23	14
Parkersburg, W. Va.	16	4	20	23	14
Wheeling, W. Va.	16	4	20	23	14
Charlotte, N. C.	16	4	20	23	14
Hickory, N. C.	16	4	20	23	14
Mt. Airy, N. C.	16	4	20	23	14
Salisbury, N. C.	16	4	20	23	14
Charleston, S. C.	16		21	24	14
Columbia, S. C.	16	5	21	24	14

*Dealers set own prices. S. O. New Jersey does not operate station.

S. O. NEW YORK

Due to local price conditions at many points in S. O. New York territory, actual prices on both gasoline and kerosene are being made at under the posted tank wagon prices published below.

New York City	17	0	17	*19	15
Albany, N. Y.	17	0	17	20	15
Buffalo, N. Y.	17	0	17	19	15
Rochester, N. Y.	17	0	17	20	15
Syracuse, N. Y.	17	0	17	19	15
Boston, Mass.	17	0	17	19	15
Augusta, Me.	17	4	21	23	15
Manchester, N. H.	17	4	21	23	15
Burlington, Vt.	17	3	20	22	15

*The Standard of New York does not operate stations in New York City. This figure is the retail price of a principal station operator selling Socony gasoline.

ATLANTIC REFINING

Pittsburgh, Pa.	16	*	16	*21	14
Philadelphia, Pa.	16	*	16	*21	14
Allentown, Pa.	16	*	16	*21	14
Erie, Pa.	16	*	16	*21	14
Scranton, Pa.	16	*	16	*21	14
Altoona, Pa.	16	*	16	*21	14
Dover, Del.	16	3	19	21	14
Wilmington, Del.	16	3	19	21	14
Providence, R. I.	17	2	19	21	15
Boston, Mass.	17	0	17	19	15
Springfield, Mass.	17	0	17	19	15
Worcester, Mass.	17	0	17	19	15
Hartford, Conn.	17	2	19	21	14
New Haven, Conn.	17	2	19	21	15

*3-cent state tax is collected by retail dealer and paid by him directly to state.

S. O. KENTUCKY

Ashland, Ky.	15	5	20	22	15.5
Catlettsburg, Ky.	15	5	20	22	15.5
Lexington, Ky.	14	5	19	21	15.5
Louisville, Ky.	14	5	19	21	14
Covington, Ky.	15	5	20	21	15.5
Clarksdale, Miss.	15	4	19	21	14.5
Gulfport, Miss.	††16.5	4	††20.5	22.5	14
Jackson, Miss.	15	4	19	21	14.5
Natchez, Miss.	14.5	4	18.5	20.5	14
Vicksburg, Miss.	14.5	4	18.5	20.5	14
Birmingham, Ala.	17	4	21	23	16
Mobile, Ala.	17	4	21	23	15
Montgomery, Ala.*	18	4	22	24	16.5
Atlanta, Ga.	17	4	21	23	†16.5
Augusta, Ga.	17	4	21	23	†16.5
Macon, Ga.	17	4	21	23	†16.5
Savannah, Ga.	15	4	19	19	14.5
Jacksonville, Fla.	15	5	20	22	13.5
Miami, Fla.	17	5	22	24	15.5
Tampa, Fla.	15	5	20	22	13.5
Pensacola, Fla.	**16	5	**21	23	13.5

*Local privilege tax of 1 cent on gasoline and ½ cent on kerosene at Montgomery included. Mobile gasoline prices include 1c city tax.

†Georgia kerosene prices include 1c state tax.

**Both tank wagon prices include 1c city tax at Pensacola, which went into effect Oct. 15, 1926.

††Both tank wagon prices at Gulfport include Harrison county privilege tax of 2c.

S. O. INDIANA

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
Chicago, Ill.	14	0	14	16	12
Decatur, Ill.	14.2	0	14.2	16.2	12.1
E. St. Louis, Ill.	13.1	0	13.1	15.35	11.2
Joliet, Ill.	14.4	0	14.4	16.4	12.3
Peoria, Ill.	14.2	0	14.2	16.2	12.1
Quincy, Ill.	14.2	0	14.2	16.2	11.9
Indianapolis, Ind.	14.2	3	17.2	19.2	13.2
Evansville, Ind.	14	3	17	19	13
South Bend, Ind.	14.4	3	17.4	19.4	13.4
Detroit, Mich.	14.8	3	17.8	19.8	13.7
Grand Rapids, Mich.	14.7	3	17.7	19.7	13.6
Saginaw, Mich.	14.9	3	17.9	19.9	13.8
Green Bay, Wis.	14.6	2	16.6	18.6	12.4
Madison, Wis.	14.3	2	16.3	18.3	12.1
Milwaukee, Wis.	14.1	2	16.1	18.1	11.9
La Crosse, Wis.	15.2	2	17.2	19.2	13
Minneapolis, Minn.	15.2	2	17.2	19.2	12.9
Duluth, Minn.	15.5	2	17.5	19.5	12.9
Mankato, Minn.	12.1	2	14.1	16.1	12.7
Des Moines, Ia.	14.5	3	17.5	19.5	12.3
Davenport, Ia.	14.5	3	17.5	19.5	12.3
Sioux City, Ia.	14.1	3	17.1	17	11.9
Mason City, Ia.	14.5	3	17.5	19.5	12.3
St. Louis, Mo.	*13.6	2	15.6	17.9	11.3
Kansas City, Mo.	†14.9	2	16.9	18.9	10.6
St. Joseph, Mo.	†14.5	2	16.5	18.5	11.2
Fargo, N. D.	16.9	2	18.9	20.9	14.9
Grand Forks, N. D.	17.2	2	19.2	21.2	15.2
Minot, N. D.	16.9	2	18.9	20.9	14.9
Pierre, S. D.	15.5	4	19.5	21.5	13.9
Huron, S. D.	15.5	4	19.5	21.5	13.9
Wichita, Kans.	12.8	2	14.8	16.8	10.8
Bartlesville, Okla.	12.5	3	15.5	17.5	10.5

S. O. Indiana's quantity discount schedule on tank wagon deliveries of gasoline outside the city of Chicago is 1c for 50 gals. or more at one delivery; 1½c for 6,000 gals. or more a month; 2c for 10,000 gals. or more a month, and 3c for 15,000 gals. or more a month.

In Chicago, above discounts apply, except the 1c for 50 gal. dumps.

Service station discount is 2c per gal. to consumers of 200 gals. or more a month, or 2400 gals. per year.

Discount on kerosene is 1c on 50 gal. dumps throughout territory.

*Includes city tax of ½c.

†Includes city tax of 1c.

CONTINENTAL OIL

Denver, Colo.	14	3	17	20	14.5
Pueblo, Colo.	14	3	17	20	14.5
Grand Junction, Colo.	17.5	3	20.5	23.5	18
Casper, Wyo.	15	3	18	20	13
Cheyenne, Wyo.	16	3	19	21	14.5
Butte, Mont.	19.5	3	22.5	22.5	19
Helena, Mont.	19.5	3	22.5	24.5	19
Salt Lake City, Utah.	17.5	3½	21	23	17
Boise, Ida.	19.5	4	23.5	25.5	19
Twin Falls, Ida.	19.5	4	23.5	25.5	19
Alburquerque, N. M.	17	5	22	25	17

S. O. CALIFORNIA

Phoenix, Ariz.	12	4	16	20	21.5
Los Angeles, Cal.	13.5	3	16.5	20.5	15.5
Fresno, Cal.	14	3	17	21	16.5
San Francisco, Cal.	14	3	17	21	15.5
Reno, Nev.	18	4	22	26	19
Portland, Ore.	14.5	3	17.5	21.5	16.5
Seattle, Wash.	14.5	2	16.5	20.5	16.5
Spokane, Wash.	18.5	2	20.5	24.5	20.5
Tacoma, Wash.	14.5	2	16.5	20.5	16.5

S. O. LOUISIANA

Little Rock, Ark.	15	5	20	22	12
Alexandria, La.	14	2	16	18	†14
Baton Rouge, La.	13	2	15	17	†12.5
Lake Charles, La.	14.5	2	16.5	18.5	†14
New Orleans, La.	*14.5	2	*16.5	*18.5	†14
Shreveport, La.	14.5	2	16.5	18.5	†13
Lafayette, La.	14	2	16	18	†12.5
Bristol, Tenn.	17	3	20	22	14
Chattanooga, Tenn.	16.5	3	19.5	21.5	15
Knoxville, Tenn.	17	3	20	22	15
Nashville, Tenn.	16	3	19	21	15
Memphis, Tenn.	15	3	18	20	14

*New Orleans gasoline prices include 1c parish tax in addition to 2c state tax, and kerosene prices include 1c state tax and 1c parish tax.

†Kerosene price in Louisiana includes 1c state tax.

S. O. OHIO

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
All Ohio points	14	3	17	19	14

S. O. NEBRASKA

Omaha, Neb.	14.25	2	16.25	18.25	12.25
McCook	15.75	2	17.75	19.75	13.75
Norfolk	14.75	2	16.75	18.75	12.75
North Platte	15.75	2	17.75	19.50	13.50
Scottsbluff	15.75	2	17.75	19.75	13.25

MAGNOLIA PETROLEUM

Muskogee, Okla.	15	3	18	20	11
Oklahoma City	14	3	17	19	11
Tulsa, Okla.	13	3	16	18	11
Fort Smith, Ark.*	15	*3	18	20	12
Little Rock, Ark.	15	5	20	22	12
Texarkana, Ark.*	13.5	*3	16.5	20.5	12
Dallas, Tex.	11	3	14	18	11
Fort Worth, Tex.	12	3	15	18	11
Houston, Tex.	11	3	14	18	15
San Antonia, Tex.	12	3	15	18	10
El Paso, Tex.	14	3	17	20	16

*Within City of Texarkana and Fort Smith, the state tax on gasoline is 3c per gal. conforming with the Texas state tax. In these two districts outside of the city the 5c Arkansas tax applies.

V. M. & P. NAPHTHA

(Changes ordinarily occur coincident with gasoline price changes)

	Oleum Spirits	V.M.&P. Naphtha	Cleaner Naphtha
Chicago	14.7	16.2	18
Detroit	16.4	17.9	19.7
Kansas City	†14.9	†16.4	†18.2
Milwaukee	15.4	*18.9	*20.7
Minneapolis	*18.7	*20.2	*22
St. Louis	14.6	16.1	17.9
New York		19	....

*Includes 2c state tax. †Includes 1c city tax.

CANADA

(Per Imperial Gallon, which is 1.2 American Gallons)

	Gasoline				Oil
			Total		
	T.W.	Tax	T.W.	S.S.	T.W.
ONTARIO					
Toronto	19.5	3	22.5	26	21
Ottawa	19.5	3	22.5	26	21
Cochrane	24.5	3	27.5	36	26
Ft. William	22.5	3	25.5	29	22.5
MANITOBA					
Winnipeg	21.5	3	24.5	28	21.5
SASKATCHEWAN					
Regina	25.5	3	28.5	33	25.5
ALBERTA					
Edmonton	26.5	3	29.5	33	26.5
Calgary	22.5	3	25.5	29	22.5
BRITISH COLUMBIA					
Vancouver	21	5	26	30	22
QUEBEC					
Montreal	20.5	5	25.5	29	21
Quebec City	22.5	5	27.5	33	23
Three Rivers	22.5	5	27.5	31	23
NEW BRUNSWICK					
St. John	22.5	3	25.5	30	22
Moncton	22.5	3	25.5	30	22
NOVA SCOTIA					
Halifax	22.5	5	27.5	32	22
Sydney	22.5	5	27.5	32	22
PRINCE EDWARD ISLAND					
Charlottetown	22.5	5	27.5	31	22

Note: In districts surrounding these points 1c additional is added to city price.

Above prices include these inspection fees on both gasoline and kerosene, per gallon: Alabama, 1/40c on gasoline, 1/2c kerosene; Arkansas, 1/20c on both; Colorado, 1/10c on both; Florida, 1/8c; Indiana, 2/25c; Kansas, 1/50c; Louisiana, 1/32c on gasoline, 1c on kerosene; Minnesota, 3/50c; Missouri, 1/50c; Nebraska, 3/50 to 1/2c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 4/25c; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c on gasoline and 1/2c on kerosene; Wisconsin, 3/50c.

Kerosene inspection fees only: Iowa, 13/100c; Michigan, 1/5 to 4/5c per gal.

In Illinois, cities and villages have the power to appoint oil inspectors and fix inspection fees which is done in some instances. In some cases in the above states or other states there are local inspection fees.

Demand Rises with Temperatures On Atlantic Seaboard

Staff Special
NEW YORK, June 16

THE weather took a favorable turn for eastern gasoline markets this week. A change in temperatures from abnormally low levels to the opposite extreme stimulated gasoline consumption along the seaboard. To those who are usually of an optimistic turn, the improvement in motoring conditions served as additional cause of bullishness in a market that already has far exceeded the expectations of a majority of the trade.

Steady refinery prices resulted as far as the current market was concerned. There was little opportunity for prices to advance, reflecting better consumer demand, because the jobbing trade is pretty well covered for its June requirements on a contract basis.

Wholesalers reported they were well satisfied to keep current commitments moving. This, they asserted, they had no trouble in doing although major jobbers had not yet begun to order out their June gasoline purchases. Shipments the last few days in May were exceptionally heavy and most of the big jobbers are still using May gasoline.

With Independence Day holiday in the offing and the tourist season yet to come, several students of the market were confidently forecasting 11-cent gasoline for July.

U. S. Motor gasoline at 10.25 cents did not remain in the market at New York harbor as much of a factor very long this week. Two companies quoting this price for spot shipment advanced 0.25-cent on Tuesday. Although Motor was still available in some quarters at 10.25 cents at the end of the week, the volume of goods purchased at this price was small in comparison to spot orders coming in at prices 0.25 to 0.5-cent higher. As the surplus of resale agents is worked off it was believed the selling trade is expected to be unanimous at 10.75 cents. This might reasonably materialize in five or six days.

The Philadelphia market was in much the same position as New York harbor. Most companies quoted 10.75 cents for new spot business, but 10.50-cent gasoline was available all week and two companies reported sufficient sales at this price to be representative of the market.

Prices at Baltimore and points south were unchanged from a week ago. U. S. Motor at Baltimore was quoted at 10.75 cents flat. The same price was in effect at Norfolk. Charleston sellers quoted 10.50 cents. Savannah and Jacksonville markets were steady at 10 to 10.25 cents.

A New England jobber reported buying a few cars of U. S. Motor at 12 cents delivered early this week, but the purchase was on firm offer made a week ago. Minimum delivered price quoted by sellers in Boston and Providence districts this week was 12.50 cents. Spot demand was reported relatively slow, but jobbers in the market for occasional cars were said to be paying the new price. Quotations on an f.o.b. shipping point basis remained at 11.25 cents.

California gasoline was steady in all eastern markets. One large dealer in this commodity at New York harbor advanced his price for tank cars to 10.75 cents on Monday establishing a minimum price for this grade at the top quoted for U. S. Motor. Other sellers in the harbor quoted 11 cents. At Baltimore, California gasoline was quoted at 10.75 cents flat. It was available at 0.25-cent less in the Philadelphia market.

Advancing tank car and tank wagon prices were the rule for kerosene in eastern markets in contrast to the receding prices noted in some other sections of the country. New York harbor was the only market along the seaboard where water white kerosene was available at 7.50 cents. Several sellers in this market were asking 7.75 and 8 cents. At Baltimore and Philadelphia a minimum of 7.75 cents was quoted.

Further improvement also was noted in burning oil prices. Only occasional cars of 28-34 gas oil were offered at under 5 cents at New York harbor. Most of the major companies quoted this price as a minimum and several were asking 5.25 cents. Furnace oil also advanced 0.25-cent to 6 cents flat. Spot demand continued slow.

Flurry of Foreign Buying Bulls Gulf Export Market

Staff Special
NEW YORK, June 16

ADVANCING prices brought a flurry of foreign buying in Gulf export markets the week of June 11. French buyers purchased several cargoes and were inquiring toward the end of the week for more. Other European buyers also were in the market. Purchases definitely known to have been closed totaled approximately 120,000 barrels of gasoline and kerosene. Intercompany transactions approximating a similar volume also were said to have been closed.

On June 12 Standard Oil Co. of New Jersey advanced its posted price for export gasoline in cases 0.5-cent at New York to 25.90 cents, a new high for 1928. This advance followed a higher tendency for bulk prices at the Gulf—the reverse of usual procedure. Suppliers at the Gulf for some time have been expressing higher ideas of the bulk market in view of steadily increasing prices in the Mid-Continent. Standard's advance acted more or less as a seal on higher prices, and the usual active demand from abroad resulted.

There was no question among the trade as to the price for 64-66, 375 end point gasoline at the Gulf at the end of this week. A large French company entered the market about the middle of the week for approximately 50,000 barrels of this commodity together with 15,000 barrels of water white and prime white kerosene. The deal was closed on June 15 with 9.75 cents, 7.25 cents and 6.25 cents, respectively, the prices obtaining.

The same buyer entered the market June 15 for a second cargo of approximately 59,000 barrels of the same three grades. More kerosene was included in the second cargo, however, than in the first. Closing prices for the second transaction reported June 16 were the same as those in the first, namely 9.75 cents, 7.25 cents and 6.25 cents. Both cargoes are for August loading.

A third cargo of approximately the same size as the first two was being sought by this buyer on June 16, for late August or early September shipment. The buyer was offering firm at the same prices paid in the previous transactions.

Among the more important inquiries in the market this week was one from a Continental buyer for a cargo for late September or early October shipment. From 40,000 to 50,000 barrels of U. S. Motor and 64-66, 375 end point gasolines were the items sought. Quotations for the business had not been obtained up to the end of this week, it was reported, largely because suppliers were unwilling to commit themselves for shipment this far ahead. The broker negotiating the transaction said quotations might be obtained next week, but undoubtedly would be 0.25-cent higher than current prices.

The trade was still somewhat in the dark regarding actual going prices for U. S. Motor. No foreign purchases

Complete Seaboard Market

(Export markets for whole year given in OIL PRICE HANDBOOK. Each volume carries refinery, tank wagon, crude and export markets—complete for the years 1924-1925-1926-1927)

Eastern Domestic Market

(Prices for tank car lots, f. o. b. refinery or seaboard terminal, represent majority of quotations and sales.)

	June 18	June 11	June 4
U.S. Motor gasoline, New York harbor	10.75	10.25 -10.75	10.25
U.S. Motor gasoline, Philadelphia	10.50 -10.75	10.25 -10.75	10.25
U.S. Motor gasoline, Boston district	*11.25	*11.25	10.50 -11.00
U.S. Motor gasoline, Providence district	*11.25	*11.25	10.50 -10.75
U.S. Motor gasoline, Baltimore	10.75	10.75	10.25
U.S. Motor gasoline, Norfolk	10.75	10.75	10.25
U.S. Motor gasoline, Charleston	10.50	10.50	10.00
U.S. Motor gasoline, Savannah	10.00 -10.25	10.00 -10.25	9.75
U.S. Motor gasoline, Jacksonville	10.00 -10.25	10.00 -10.25	9.75
California U.S. Motor gasoline, New York Harbor	10.75 -11.00	10.75 -11.00	10.50
California U.S. Motor gasoline, Baltimore	10.75	10.75	10.50
California U.S. Motor gasoline, Philadelphia	10.50 -10.75	10.50 -10.75	10.50
Water white kerosene, New York Harbor	8.00	7.50 - 8.00	7.50 - 8.00
Water white kerosene, Philadelphia	7.75 - 8.00	7.50 - 7.75	7.50 - 7.75
Water white kerosene, Baltimore	8.00	8.00	8.00
28-34 gas oil, New York harbor	5.00 - 5.25	4.75 - 5.00	4.50 - 4.75
28-34 gas oil, Boston district	5.00 - 5.25	5.00 - 5.25	4.75 - 5.00
36-40 furnace oil, New York harbor	6.00	5.75 - 6.00	5.75
36-40 furnace oil, Boston district	6.25 - 6.50	6.00 - 6.50	6.00
Grade C bunker oil, New York harbor	$1.25	$1.25	$1.25
Grade C bunker oil, Boston district	$1.25	$1.25	$1.25
Diesel oil, New York harbor	$2.00	$2.00	$2.00

Note: Above prices do not include inspection tax levied in some states.
*Minimum of 12.50c delivered.

MEDICINAL OILS

Russian 885-890 s.g., 325-330 vis	$0.80 - 0.90	$0.80 - 0.90	$0.80 - 0.90
Russian 870-875 s.g., 150-155 vis	$0.67 - 0.77	$0.67 - 0.77	$0.67 - 0.77
Russian 860-865 s.g., 80-85 vis	$0.65 - 0.75	$0.65 - 0.75	$0.65 - 0.75

New York Export Market

(Gasoline and kerosene in cases in bulk. Lubricating oils are per gal. in bbls. Cylinder oils are Penna. products.)

	June 18	June 11	June 4
U. S. Motor gasoline	25.90	25.40	25.40
43-45 150 w.w. kerosene	18.40	18.40	18.40
42-44, 110 s.w. kerosene	17.40	17.40	17.40
CYLINDER OILS			
Bright stock, dark	38.00 -40.00	36.50 -37.50	35.00 -36.00
600 D filtered	30.00 -32.00	30.00 -32.00	30.00 -32.00
600 Warren E filtered	24.00 -25.00	24.00 -25.00	23.50 -24.50
600 s.r. unfiltered	18.00 -19.00	17.25 -18.00	17.00 -18.00
650 s.r. unfiltered	20.00 -22.00	19.50 -21.00	19.00 -19.50
600 flash s.r.	23.00 -26.00	22.00 -25.00	21.00 -25.00
630 flash, s.r.	34.00 -36.00	33.00 -35.00	33.00 -35.00
RED ENGINE OILS (Vis. 100°)			
300 vis. No. 6½ color	19.50	19.50	19.50
250 vis. No. 6 color	18.50	18.50	18.50
200 vis. No. 6 color	18.00	18.00	18.00
PALE ENGINE OILS (Vis. 100°)			
230 vis. No. 3¾ color	23.50	23.50	23.50
180 vis. No. 3¼ color	19.50	19.50	19.50
100 vis. No. 2¼ color	15.25	15.25	15.25
MOTOR OILS (Vis. 100°)			
600 vis. No. 7 color	34.50	34.50	34.50
500 vis. No. 6½ color	32.50	32.50	32.50
400 vis. No. 7¼ color	30.50	30.50	30.50
300 vis. No. 6 color	29.50	29.50	29.50
200 vis. No. 3¼ color	23.00	23.00	23.00
MEDICINAL OILS			
875-885 s.g.	$0.80	$0.80	$0.80
865-870 s.g.	$0.70	$0.70	$0.70

WAXES (In cents per pound, f.a.s. carload lots)
WHITE CRUDE SCALE (In barrels)

	June 18	June 11	June 4
122-124 A.m.p.	4.25 - 4.50	4.25 - 4.50	4.25 - 4.375
124-126 A.m.p.	4.25 - 4.50	4.25 - 4.50	4.25 - 4.375
FULLY REFINED (In burlap bags)			
123-125 A.m.p. Phila.	4.875- 5.00	4.875- 5.00	4.75
125-127 A.m.p.	4.875- 5.00	4.875- 5.00	4.75
128-130 A.m.p.	5.125- 5.25	5.125- 5.25	5.00
130-132 A.m.p.	5.25 - 5.50	5.25 - 5.50	5.50
133-135 A.m.p.	*6.00 - 6.50	*6.00 - 6.50	*6.00
135-137 A.m.p.	*6.75 - 7.00	*6.75 - 7.00	*6.75 - 7.00
YELLOW CRUDE SCALE			
124-126 A.m.p.	4.125	4.125- 4.25	4.125

***Prices nominal.**

Gulf Export Market

(Prices are f. o. b. Gulf oil terminals in Texas and Louisiana, shipments of 20,000 bbls. and over unless otherwise noted, representing sellers' opinions, except those prices specified to the contrary)

GASOLINE	June 18	June 11	June 4
U.S. Motor	9.00 - 9.25	8.875- 9.00	8.75 - 9.00
60-62, 400 e.p.	9.25	9.00	9.00
61-63, 390 e.p.	9.50	9.25	9.25
64-66, 375 e.p.	9.75	9.50	9.50
U. S. Motor, cases (cargoes)	$1.75	$1.75	$1.75
64-66, cases (cargoes)	$1.85	$1.85	$1.85

***Sales only.**

KEROSENE			
44 water white	7.25	7.50	7.50
41-43 prime white	6.25	6.50	6.50
Water white, cases (cargoes)	$1.65	$1.65	$1.65
Prime white, cases (cargoes)	$1.55	$1.55	$1.55
DOMESTIC GAS & BUNKER OILS			
*26-30 translucent gas oil	3.875- 4.00	3.875- 4.00	3.875- 4.00
*30-32 translucent gas oil	4.00	4.00	4.00
Grade C bunker oil	$0.95 - 1.10	$0.95 - 1.10	$0.95 - 1.10
Grade C bunker oil, cargoes	$0.85 - 0.90	$0.85 - 0.90	$0.85 - 0.90

***Less than ½ of 1% sulfur.**

MEXICAN CRUDE AND BUNKER OILS (F.O.B. Steamer, Tampico)			
Heavy Panuco crude taxes to be paid	$1.02 -$1.05	$1.02 -$1.05	$1.05
Grade C bunker oil, for bunkering purposes, taxes paid	$1.15	$1.15	$1.02 -$1.15

SOUTH TEXAS LUBRICATING OILS (Viscosity at 100°F.; cold test 0) (Tanker, f.o.b. Houston)

100 vis. No. 2 unfiltered pale	6.00	6.00	6.00
200 vis. No. 3 unfiltered pale	7.75 - 8.00	7.75 - 8.00	7.75 - 8.00
300 vis. No. 3 unfiltered pale	9.25 - 9.50	9.25 - 9.50	9.25 - 9.50
500 vis. No. 3½ unfiltered pale	11.50 -12.00	11.50 -12.00	11.50 -12.00
750 vis. No. 4 unfiltered pale	12.50 -13.00	12.50 -13.00	12.50 -13.00
1200 vis. No. 5 unfiltered pale	15.50 -16.00	15.50 -16.00	15.50 -16.00
200 vis. No. 5-6 red oil	7.00 - 7.50	7.00 - 7.50	7.00 - 7.50
300 vis. No. 5-6 red oil	8.00 - 8.50	8.00 - 8.50	8.00 - 8.50
500 vis. No. 5-6 red oil	10.00 -10.50	10.00 -10.50	10.00 -10.50
750 vis. No. 5-6 red oil	11.25 -11.50	11.25 -11.50	11.25 -11.50
1200 vis. No. 5-6 red oil	14.50 -15.50	14.50 -15.50	14.50 -15.50

Pacific Export Market

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gallon, except where otherwise noted.)

	June 18	June 11	June 4
Gasoline, U. S. Motor, 53-55 Gravity	7.75 - 8.00	7.75 - 8.00	7.75 - 8.00
Gasoline, U. S. Motor, blends and special cuts	8.00 - 9.00	8.00 - 9.00	9.00 - 9.50
Gas Oil, 30-34, per barrel	$1.10 -$1.20	$1.10 -$1.20	$1.10 -$1.20
Diesel Oil, 27 plus, per barrel	$0.95 -$1.10	$0.95 -$1.10	$0.95 -$1.10
Bunker oil, 14-18, per barrel	$0.80 -$1.00	$0.80 -$1.00	$0.80 -$1.00
Fuel oil, 14-18, per barrel	$0.75 -$1.00	$0.75 -$1.00	$0.75 -$1.00
Kerosene, 38-40 w.w., 125-150 flash, per gal.	4.50 - 5.00	4.50 - 5.00	4.50 - 5.00
Cased Goods			
Gasoline, U. S. Motor	$1.75 -$1.95	$1.75 -$1.95	$1.80 -$2.00
Kerosene, 38-40 w.w., 125-150 flash	$1.45 -$1.50	$1.45 -$1.50	$1.45 -$1.50

Crude Oil Prices, as Posted by Major

(Crude prices for years 1924-1925-1926-1927 in

EASTERN FIELDS

(Posted by Joseph Seep Purchasing Agency)

Penna. Grade Oil in New York Transit Lines (Alleghany, N. Y. District)	$3.05
Bradford District Oil in National Transit Lines (Bradford District)	3.05
Penna. Grade Oil in National Transit Lines (Other Pennsylvania)	2.90
Penna. Grade Oil in Southwest Penna. Pipe Lines (Other Pennsylvania)	2.90
Penna. Grade Oil in Eureka Pipe Lines (West Virginia)	2.85
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O. district)	2.65
Keister Grade in National Transit Lines (Butler Co.)	1.20
Cabell Grade in Eureka Pipe Lines (West Virginia)	1.45
Corning Grade in Buckeye Pipe Lines (Ohio)	1.55
Corning, O. heavy grade	1.45
Somerset Oil in Cumberland Pipe Lines (Kentucky)	1.55
Ragland Grade in Cumberland Pipe Lines (Kentucky)	.95

(Posted by Stoll Oil Refining Co.)

Oil City, Ky., oil in Stoll lines	$1.50

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

Wooster	$1.57	Plymouth	$1.23
Lima	1.55	West Kentucky	1.33
Waterloo	1.20	*Canadian Petro.	1.95
Indiana	1.32	*Oil Springs	2.02
Princeton	1.50	*Posted by Imperial Oil Ltd.	
Illinois	1.50		

OKLAHOMA, KANSAS and NORTH TEXAS

Prices of Prairie Oil & Gas Co.

(In Oklahoma, Kansas, North and East Central Texas)

Effective Feb. 21, 1928

28-28.9	$0.96	41-41.9	$1.43
29-29.9	1.01	42-42.9	1.46
30-30.9	1.06	43-43.9	1.49
31-31.9	1.11	44-44.9	1.52
32-32.9	1.16	45-45.9	1.55
33-33.9	1.19	46-46.9	1.58
34-34.9	1.22	47-47.9	1.61
35-35.9	1.25	48-48.9	1.64
36-36.9	1.28	49-49.9	1.67
37-37.9	1.31	50-50.9	1.70
38-38.9	1.34	51-51.9	1.73
39-39.9	1.37	52 and above	1.76
40-40.9	1.40		

Humble Oil & Refining Co. Prices

(Ranger, North Texas, Mexia, Powell, Richland, Wortham, Lytton Springs, Currie, Moran and Nocona crudes all in Texas.)

Effective Feb. 21, 1928

Below 25	$0.76	26-26.9	$0.86
25-25.9	0.81	27-27.9	0.91

Humble Prices (Cont'd)

28-28.9	$0.96	37-37.9	$1.31
29-29.9	1.01	38-38.9	1.34
30-30.9	1.06	39-39.9	1.37
31-31.9	1.11	40-40.9	1.40
32-32.9	1.16	41-41.9	1.43
33-33.9	1.19	42-42.9	1.46
34-34.9	1.22	43-43.9	1.49
35-35.9	1.25	44 and above	1.52
36-36.9	1.28		

Mirando, Tex	$1.00

Magnolia Petroleum Co.

(In Oklahoma, Kansas and North and East Central Texas)

Feb. 21, Magnolia posted in above fields and in Panola Co., same schedule as Prairie, except these grades, unchanged from Feb. 16:

Below 30	$0.75
30-30.9	0.90
31-31.9	1.05
Glasscock and Howard Counties	$0.60
Chalkfield (Howard Co.)	$0.80
Iatan district	$0.93
Corsicana heavy	$1.00

Carter Oil Co.

(Oklahoma and Kansas)

Feb. 21, same schedule as Prairie plus these grades:

24-24.9	$0.76	26-26.9	$0.86
25-25.9	0.81	27-27.9	0.91

PANHANDLE, TEXAS

Humble Oil & Refining Co.

Effective Feb. 21, 1928

Hutchinson and Carson Counties:

Below 31	$0.60	38-38.9	$0.88
31-31.9	0.65	39-39.9	0.91
32-32.9	0.70	40-40.9	0.94
33-33.9	0.73	41-41.9	0.97
34-34.9	0.76	42-42.9	1.00
35-35.9	0.79	43-43.9	1.03
36-36.9	0.82	44 and above	1.06
37-37.9	0.85		

Wheeler County:

Below 29	$0.60	37-37.9	$0.95
29-29.9	0.65	38-38.9	0.98
30-30.9	0.70	39-39.9	1.01
31-31.9	0.75	40-40.9	1.04
32-32.9	0.80	41-41.9	1.07
33-33.9	0.83	42-42.9	1.10
34-34.9	0.86	43-43.9	1.13
35-35.9	0.89	44 and above	1.16
36-36.9	0.92		

Gray County:

Below 27	$0.60	36-36.9	$1.02
27-27.9	0.65	37-37.9	1.05
28-28.9	0.70	38-38.9	1.08
29-29.9	0.75	39-39.9	1.11
30-30.9	0.80	40-40.9	1.14
31-31.9	0.85	41-41.9	1.17
32-32.9	0.90	42-42.9	1.20
33-33.9	0.93	43-43.9	1.23
34-34.9	0.96	44 and above	1.26
35-35.9	0.99		

WEST TEXAS

Humble Oil & Refining Co.

Effective Aug. 23, 1927

Crane, Upton, Crockett and Pecos Counties	$0.60

NORTH LOUISIANA—ARKANSAS FIELDS

Prices of Standard Oil Co. of Louisiana Caddo, Homer, Haynesville, Bull Bayou, El Dorado, Crichton and De Soto

Effective Feb. 21, 1928

Below 28	$0,91	40-40.9	$1.40
28-28.9	0.96	41-41.9	1.43
29-29.9	1.01	42-42.9	1.46
30-30.9	1.06	43-43.9	1.49
31-31.9	1.11	44-44.9	1.52
32-32.9	1.16	45-45.9	1.55
33-33.9	1.19	46-46.9	1.58
34-34.9	1.22	47-47.9	1.61
35-35.9	1.25	48-48.9	1.64
36-36.9	1.28	49-49.9	1.67
37-37.9	1.31	50-50.9	1.70
38-38.9	1.34	51-51.9	1.73
39-39.9	1.37	52 and above	1.76

Cotton Valley, below 36, $0.75. Rest of Cotton Valley schedule, beginning with 36-36.9 at $1.28, same as Caddo, Homer, etc.

Smackover, below 24	$0.75
do 24 and above	.90
Bellevue	1.25
*Urania, La	.75
†East El Dorado	1.00

*Posted by Louisiana Oil Refining Corp.

†Posted by Magnolia Petroleum Co.

Smackover prices posted on Feb. 7 by S. O. La. Gulf, Shreveport-El Dorado Pipe Line, Atlantic Oil Producing Co. and The Texas Co.; on Feb. 8 by Magnolia; on Feb. 6 by La. Oil Refg. Corp.

STEPHENS, ARKANSAS

Louisiana Oil Refining Corp.

Below 28	$0.85	30-30.9	$0.91
28-28.9	0.87	31-31.9	0.93
29-29.9	0.89	32 and above	0.95

GULF COASTAL

Posted by Humble Oil & Refining Co.

Effective March 14, 1927

Grades A	$1.20	29-29.9	$1.25
Grades B:		30-30.9	1.27
Below 25	1.15	31-31.9	1.29
25-25.9	1.17	32-32.9	1.31
26-26.9	1.19	33-33.9	1.33
27-27.9	1.21	34-34.9	1.35
28-28.9	1.23	35 and above	1.37

Fields classified as A and B are Spindletop, Goose Creek, Hull, Liberty, Sour Lake, West Columbia, Orange, Boling and Pierce Junction. All other fields are Grades A only.

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have included this grade since the quoted market advanced. A United Kingdom buyer purchased a part cargo, approximately 20,000 barrels, of U. S. Motor this week at 8.875 cents. Firm offer at this price was made a week ago, however, and the sale was not considered by most of the trade as representative of the current market.

The buying this week gave suppliers a more definite idea of the kerosene market. Prices at which business was closed were 0.25-cent under prices quoted for water white and prime white for several weeks past, but they were not surprising, considering the downward trend in the field.

The market for heavy oils was featureless and quotations were largely the same as a week ago. Foreign demand for gas oil is expected to pick up in the next few weeks.

Crude Price Changes

OIL CITY—On June 13 Joseph Seep Purchasing Agency advanced eastern crudes from 10 to 30 cents, except Corning and Ragland, which were unchanged. All Pennsylvania grade crude was advanced 25 cents, except the Macksburg, O. district, which was advanced 30 cents, and Keister grade, which went up 10 cents. Cabell and Somerset crude were raised 10 cents. New prices, and amounts of advance, are:

Bradford-Alleghany district crude in National Transit and New York Transit lines, up 25 cents, to $3.05; rest of Pennsylvania in National Transit and Southwest Pennsylvania Pipe Line lines, up 25 cents, to $2.90; Pennsylvania grade in West Virginia, in Eureka lines, up 25 cents, to $2.85; Pennsylvania grade in Macksburg district, in Buckeye lines, up 30 cents, to $2.65; Keister grade in National Transit lines, up 10 cents, to $1.20; Cabell, in Eureka lines, up 10 cents to $1.45; and Somerset, in Cumberland lines, up 10 cents, to $1.55 per barrel at wells.

This is the first change on Pennsylvania crude this year, the last previous change having been a 5 cent advance on Dec. 17, 1927.

Gulf Coast Lubes Higher

HOUSTON, June 18.—Strength in Houston district lubricant markets brought upward revision of prices at end of last week in spot tank car quantities. Stocks of various grades are now reported reasonably low and demand is more active than it has been for some time.

LOS ANGELES, June 15.—N. W. Wickersham, formerly valuation engineer for Chanslor-Canfield-Midway Oil Co., is now chief engineer of Perkins Cementing, Inc., Los Angeles.

Purchasers, in All Fields (in Effect June 18)

OIL PRICE HANDBOOK published annually)

GULF COASTAL

Prices of The Texas Co.

Effective March 14, 1927

Grades A.....$1.20	*Grades B.....$1.15
‡Grades B (light crude):	
35-35.9.....$1.37	38-38.9.....$1.43
36-36.9..... 1.39	39-39.9..... 1.45
37-37.9..... 1.41	40 and above... 1.47

*Grades B include all heavy crudes which do not meet tests for Grades A or for Gulf Coast light crude.

‡The Texas Co.'s gravity and price schedule on oil below 35° is same as Humble's postings on Grades B.

ROCKY MOUNTAIN FIELDS

Prices of Ohio Oil Co., and Midwest Refining Co.

(Salt Creek prices effective Feb. 21, 1928)

‡Salt Creek below 29	$0.96
" " 29-29.9	1.01
" " 30-30.9	1.06
" " 31-31.9	1.11
" " 32-32.9	1.16
" " 33-33.9	1.19
" " 34-34.9	1.22
" " 35-35.9	1.25
" " 36-36.9	1.28
" " 37 and above	1.31
Elk Basin	1.33
Grass Creek light	1.33
Big Muddy	$1.25
Lance Creek	1.33
Rock Creek	1.25
Mule Creek	1.10
Rex Lake	1.10
‡Osage	1.33
‡Cat Creek, Mont.	1.33
Sunburst, Mont.	1.65
‡Hogback, N. Mex.	1.38
Artesia, N. Mex.	1.00

‡Posted by Midwest Refining Co. Midwest also buys Grass Creek light and Elk Basin.

The Texas Co. buys Salt Creek and Big Muddy crude.

CALIFORNIA

Standard Oil Co. of California

Santa Maria and Ventura Posted by Union Oil Co.

Gravity	Signal Hill Seal Beach Alamitos Heights Huntington Beach	Inglewood Torrance	Whittier La Habra	Newhall, McKittrick, Kern River	Olinda-Brea Canon, Richfield	Athens-Rosecrans Dominguez	Montebello	Coyote Hills	Santa Fe Springs	Midway-Sunset Buena Vista & Elk Hills	Lost Hills	Coalinga	Wheeler Ridge	Santa Maria	Ventura
14-14.9	$ .85	$ .85	$ .85	$ .75	$ .85	....	$ .85	$ .85	....	$ .75	$ .75	$ .75	$ .75	$ .85	$ .85
15-15.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
16-16.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
17-17.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
18-18.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
19-19.9	.85	.85	.85	.75	.85	....	.85	.85	....	.75	.75	.75	.75	.85	.85
20-20.9	.85	.85	.85	....	.85	....	.85	.85	....	.77	.77	.76	.76	.85	.85
21-21.9	.86	.86	.85	....	.86	....	.85	.86	.85	.79	.79	.77	.77	.85	.85
22-22.9	.87	.87	.85	....	.87	....	.85	.87	.85	.81	.81	.78	.78	.85	.85
23-23.9	.88	.88	....	....	.88	....	.85	.88	.85	.83	.83	.79	.79	.85	.85
24-24.9	.89	.89	....	....	.89	$ .89	.85	.89	.85	.85	.85	.80	.80	.85	.85
25-25.9	.90	.90	....	....	.90	.90	.86	.90	.86	.87	.87	.81	.81	.86	.86
26-26.9	.92	.92	....	....	.92	.92	.87	.91	.87	.89	.89	.83	.82	.87	.87
27-27.9	.94	.94	....	....	.94	.94	.88	.92	.88	.91	.91	.85	.83	.88	.88
28-28.9	.96	.96	....	....	.96	.96	.89	.93	.89	.93	.93	.87	....	.89	.89
29-29.9	.98	....	....	....	.98	.98	.90	.94	.91	.96	.96	.89	....	.91	.91
30-30.9	1.00	....	....	....	1.00	1.00	.91	.95	.93	.99	.99	.91	....	.93	.93
31-31.9	1.03	....	....	....	....	1.03	....	....	.95	1.02	1.02	.93	....	....	.95
32-32.9	1.06	....	....	....	....	1.06	....	....	.97	1.05	1.05	.95	....	....	.97
33-33.9	....	....	....	....	....	1.09	....	....	.99	1.08	1.08	.97	....	....	.99
34-34.9	....	....	....	....	....	1.12	....	....	1.01	....	1.11	.99	....	....	1.01
35-35.9	....	....	....	....	....	1.15	....	....	1.03	....	....	1.01	....	....	1.03
36-36.9	....	....	....	....	....	1.18	....	....	1.06	....	....	....	....	....	1.06
37-37.9	....	....	....	....	....	1.21	....	....	1.09	....	....	....	....	....	1.09
38-38.9	....	....	....	....	....	1.24	....	....	1.12	....	....	....	....	....	1.12
39-39.9	....	....	....	....	....	1.27	....	....	1.15	....	....	....	....	....	1.15
40-40.9	....	....	....	....	....	1.30	....	....	....	....	....	....	....	....	....
41-41.9	....	....	....	....	....	1.33	....	....	....	....	....	....	....	....	....
42-42.9	....	....	....	....	....	1.36	....	....	....	....	....	....	....	....	....

*Union Oil Co. also purchases Long Beach Crude and is maintaining the same gravity and price schedule in that field as the Standard maintains in Signal Hill and Huntington Beach fields. The Union also buys and pays the same prices as the Standard in the Rosecrans-Dominguez fields, on gravities ranging from 14 degrees to and including 24.9 degrees and in Santa Fe Springs, on gravities ranging from 20 to and including 23.9 Pegrees.

REFINERS' and COMPOUNDERS' SUPPLIES

Following are average market prices for materials used by refiners and compounders as effective the date shown.

	June 18	June 11
Refiners' Supplies		
Soda Ash light 58% bags, cwt.	$1.32	$1.32
Silicate of Soda 60 deg. drums, cwt.	$1.65	$1.65
Silicate of Soda 40 deg. tank cars, cwt.	$0.60	$0.60
Silicate of Soda 40 deg. drums, cwt.	$0.70-0.75	$0.70-0.75
Sal Soda wks.	$0.90	$0.90
Caustic Soda 76% solid, cwt.	$2.90	$2.90
Sulfuric Acid 60 deg. tank cars, f.o.b. shipping point per ton.	$11.00	$11.00
Oleum 20%, fuming sulfuric, tank cars, wks.	$18.50	$18.50
Sulfur, flowers of, cwt.	$3.10-4.00	$3.10-4.00
Liquid Chlorine, tank cars, wks., lb.	3.50-5.00	3.50-5.00
Litharge, powdered, casks, cwt.	8.75	8.75
Compounders' Supplies		
Vegetable Oils		
Linseed carloads, spot, lb.	10.20	10.40
Tanks, spot	9.40	9.60
Soya Bean, Tanks, coast, lb.	9.50-9.75	9.50-9.75
Oleic Acid		
Distilled, tanks, lb.	9.00	9.00
Distilled, bbls., lb.	9.75	9.75
Saponified, tanks, lb.	9.25	9.25
Saponified, bbls., lb.	10.00	10.00
Lard Oils		
Prime Winter Strained, lb.	16.25	16.25
Extra Winter Strained, lb.	13.25	13.25
Extra, lb.	12.75	12.75
Extra No. 1, lb.	12.25	12.25
No. 1, lb.	11.75	11.75
No. 2, lb.	11.375	11.375
Tallow oil, lb.	11.625	11.625
Neatsfoot Oil		
Pure, bbls., lb.	15.25	15.75
Extra, bbls., lb.	12.50	12.50
No. 1 bbls., lb.	12.00	12.00
Cold Pressed, lb.	18.75	18.75
Fish Oils		
Menhaden Oil		
Light Pressed, gal.	63-65	63-65
Light Pressed, tank cars, N. Y., gal.	54-56	54-56
White bleached, gal.	70-71	70-71
Yellow bleached, gal.	68-69	68-69
Whale, extra winter bleached, gal.	82-84	82-84
Naval Stores		
Steam distilled turpentine, N. Y., gal.	52	51
Steam distilled turpentine, Savannah, gal.	48	46
Gum turpentine, N. Y., gal.	58	56
Gum terpentine, f.o.b. cars Savannah, gal.	54	52
Wood Rosin F, N. Y., bbl.	$7.80	$7.80
Wood Rosin F, Savn'h., bbl.	$7.00	$7.00
Gum Rosin B, N. Y., bbl.	$8.55	$8.40
Gum Rosin B, f.o.b. cars Savannah, bbl.	$7.80	$7.70
Rosin oil, pure, gal.	55	54
Rosin oil, compounded, gal.	45	45
Pine Tar		
Kiln burnt, bbl.	$12.50-14.00	$12.50-14.00
Retort, bbl.	$13.50-15.50	$13.50-15.50
Alcohol		
Denatured, Formula 5, in bbls., per gal.	51-55	51-55

*Nominal.

Jobbers' Thin Margin Stimulates Talk of Tank Wagon Advance

Staff Special
CHICAGO, June 16

GASOLINES continued to draw greatest attention in the Chicago market in the week ended June 16. For the first time in several months a week passed without a price advance. Prices were firm, however, and several sellers advanced their quotations .125 cent June 16.

Through the entire week, by far the bulk of sales on U. S. Motor gasoline were at 7.75 cents. Some sellers were getting 7.875 and 8 cents for this grade as the week closed and others intimated they would advance their prices June 18.

Spot demand was only fair during the early days of the week but picked up considerably toward the close as a result of favorable motoring weather enjoyed over most of the territory. Demand for contract gasoline was heavy. Refiners and marketers reported that jobbers were ordering out gasoline to the limit of their contracts, as in most cases paying less than prevailing spot market prices. One refiner reported that 90 per cent of his contract customers ordered out their entire months requirements during the week ended June 9.

Possibility of a tank wagon advance or a change in the Q.D.A. again was the chief item of interest in the local market. Several of the trade expressed the opinion that the narrowing jobber's spread would keep them out of the market unless absolutely in need of goods.

Demand for higher gravity gasolines was light this week. Reports of export activity in Group 3, however, has helped to keep prices at their present level. These grades are only slightly changed in price.

The 60-62, 437 e.p. gasoline moved at 7.75 to 7.875 cents until June 13 and mostly at 7.875 cents thereafter. Gasoline of 60-62, 400 e.p. sold at 8 to 8.125 cents all week. The 64-66, 375 e.p. grade moved at 8.25 to 8.375 cents June 16, after moving previously at 8.25 cents flat.

The kerosene market evinced but little life. Most sellers reported only occasional spot inquiries and said contract customers were ordering out goods at about normal rate for the season. Prices were approximately .125 cent lower as the week closed. The bulk of 41-43 w.w. kerosene moved at 4.875 to 5 cents until June 14, and at 4.75 to 5 cents thereafter. Sales as low as 4.625 cents were reported June 16, but it was not freely available at that figure.

Buying of distillate on the spot market was light this week. Interest centered mostly around contract goods. A large number of furnace oil contracts for delivery next winter were closed. Practically all of these were on the basis of, "spot price date of shipment," with minimum and maximum price clauses. One refiner was closing contracts on such basis with a maximum of 4 cents and a minimum of 3 cents. Spot 38-40 straw distillate continued to bring 3 to 3.125 cents.

Gas oils were generally quiet this week and prices of ordinary grades unchanged. The spread between prices of ordinary goods and zero cold test products narrowed during the week. Ordinary 32-36 dark gas oil moved at 2.50 to 2.625 cents all week. Zero gas oil of like grade opened June 11 at 2.75 cents flat and moved thereafter at 2.625 to 2.75 cents. Straw zero 32-36 gas oil opened at 2.875 to 3 cents, stood at 2.75 to 2.875 cents until June 16 but closed at 2.625 to 2.875 cents.

Fuel oil prices continued their downward trend. Demand was not heavy and prices lowered approximately 2.50 cents a barrel over the week. Fuel of 28-30 gravity moved at $0.875 to $0.95 until June 14 and at $0.85 to $0.95 thereafter. Both the 24-26 and 22-26 grades receded to $0.725 to $0.775 on that date having moved at $0.75 to $0.80 before. Most sales of 18-22 fuel were at $0.675 to $0.75 until June 14 and at $0.65 to $0.725 thereafter. Some sales of this grade were reported at $0.625 but the goods had a high sulfur content. Marketers reported they could buy 18-22 fuel at $0.60. Quotations on Smackover treated fuel were unchanged at $0.80 to $0.85.

Brief shower periods will occur next week in the Standard of Indiana territory. Temperatures will be variable but remain near the seasonal normal, the official weekly forecast says.

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Cylinder, Bright Stocks Up on Crude Advance

CLEVELAND, June 16.—Steam refined and bright stocks were up in western Pennsylvania market following advance in Pennsylvania crude June 13. Other goods were unchanged in price.

Half cent advances were recorded in steam refined stocks. Bright stock was up 1 cent. One refiner with a limited quantity of bright stock was asking 36 cents for light and 34 cents for dark, these prices being 1 cent above the general level.

U. S. Motor gasoline quotations centered at 10.75 cents. Some refiners were quoting 11 cents, some 10.50 cents. Demand, on the whole, was reported to be good, with some refiners reporting business rather light on account of inclement weather a week ago.

Kerosene prices were down. The 45 w.w. grade quotations were 6.75 cents generally with refiners quoting a .25 cent above and below.

Kentucky Gasoline Scarce

ASHLAND, June 18.—Gasoline supply is not equal to demand in eastern Kentucky refining district, and no gasoline is available for spot shipment. Kerosene is moving satisfactorily at unchanged prices. Fuel oil demand is very light and price is down .125c. Gas oil price is also down .125c over past week. June 18 prices, f.o.b. eastern Ky. refinery, are:

Gasolines	None available
41-43 kerosene	7.00
32-36 gas oil	4.125
24-26 fuel oil	3.25

LOS ANGELES, June 15.—A. Llewellyn Howell, petroleum engineer, now occupies new offices at 809 Pacific Southwest Bank Bldg., Los Angeles.

OIL STOCKS AND FINANCES

National Petroleum News

Richfield-Pan American Merger Expected Early in July

Staff Special

LOS ANGELES, June 16

ANNOUNCEMENT that control of the Pan American Western Petroleum Co. will be sold to Richfield Oil Co., is expected to be made at the annual meeting of Pan American July 6. Richfield will purchase the control from the Petroleum Securities Co., E. L. Doheny's personal investment corporation.

Announcement of the proposed merger had been expected June 5 when the Pan American meeting was to have been held. R. M. Sands, secretary of Pan American, made this announcement June 15:

"Inasmuch as the compilation of the figures for the annual statement for the year 1927 is still in the hands of our accounting department, and not yet ready for publication, the meeting of stockholders is postponed until Friday, July 6.

"With the issuance of the annual statement for 1927, we will also present a profit and loss statement, actual and estimated, for the first half of the current year so as to give the stockholders a picture of the present condition of the company."

It is now said there will be no serious objection from minority stockholders to the consolidation.

Richfield will pay cash for 100,010 shares of Class A Pan American voting stock and 50,000 shares of Class B non-voting stock. Application has been made to the California corporation department to sell $5,000,000 convertible notes and 100,000 shares of Richfield common stock at $35 a share. It is expected this permission will be granted. Richfield's $25 a stock has been selling about $50 a share on the New York Stock Exchange. Proceeds from sale of these securities will be used to finance the deal.

This deal will make the Richfield Oil Co. third in point of gallonage in gasoline sales in California and perhaps on the west coast. It would place the Richfield in fourth place in point of daily average production of crude oil. During April its production averaged about 30,000 barrels a day, and Pan American's 16,000 barrels making a total production of 46,000 barrels for the two companies.

The Pan American Western Petroleum Co. owns completely the Pan American Petroleum Co. and the pipe line company that operates a 10-inch welded line from Kern county to the Los Angeles Basin district. Pan American also owns a pipe line system connecting its Los Angeles Basin production properties with the company's refinery, in addition to a 4-inch gasoline line from its refinery to the main Los Angeles distributing plant.

The Pan American operates a most up-to-date and complete refinery in the Los Angeles Harbor district of 60,000 barrels capacity, which includes 12,000 barrels daily average cracking capacity. The Black process is used. The refinery also includes a complete lubricating oil plant with a capacity output of 63,000 gallons a day and also a capacity of 16,000 pounds of grease daily. The asphalt plant has a daily capacity of 225 tons. The company also operates three natural gasoline plants.

The storage of the Pan American in southern California has a total capacity of 20,500,000 barrels. It is generally reported it has in storage more than 5,000,000 barrels of gasoline, in addition to 4,000,000 barrels of crude and a fairly large stock of fuel oil.

Pan American operates bulk stations and about 100 retail service stations in southern California. It also serves Independent service stations. The company-owned service stations are on property owned in fee by the Petroleum Securities Co., a concern that is completely owned by the Doheny family, and in which the Pan American holds no interest.

The Richfield Oil Co., which in the last two years took over the United Oil Co. and several other smaller concerns, has a total refining charging capacity of 62,000 barrels a day. Its main plant is at Hynes near Long Beach. This plant has a total daily charging capacity of 52,000 barrels, which includes 12,000 barrels cracking capacity. The Cross process is used. Three smaller plants are at Bakersfield, Huntington Beach and Vernon.

The Richfield's total sales of gasoline the first three months of this year were 50,000,000 gallons of which 27,653,458 gallons was sold in California.

Richfield sells its products up and down the Pacific coast and only recently announced plans for erection of a storage base at Seattle to handle its northwestern trade. This base will have a capacity of 198,000 barrels. Richfield serves approximately 8000 dealers on the Pacific coast, operates 30 bulk stations and has 90 company-owned service stations.

Richfield owns and operates 10 natural gasoline plants in southern California. The company holds under lease 11,900 acres and owns 5500 acres in fee, including 120 acres in the heart of the Long Beach field, where it has 35 wells now drilling to the deep sand. The company owns 230 producing wells.

Gibson Plans Changing Capital Structure

NEW YORK, June 16.—Reorganization of the capital structure of the Gibson Oil Corp. and the flotation of $1,000,000 new stock is expected to be approved by stockholders meeting June 18.

The company's present capital is 1,000,000 shares of $1 stock. The new structure would be 200,000 shares of no par stock. An exchange would be on a basis of 10 shares of one for one share of new. This exchange would absorb 100,000 shares of new stock. The remaining 100,000 shares would be offered stockholders at $10 a share.

Financial Notes

Cumberland Pipe Line Co.—Meeting of stockholders called for July 11 at Winchester, Ky., to vote on proposal to reduce capital stock from $3,000,000 to $1,500,000 and reduce par value from $100 to $50 a share.

Standard Oil Co. of Indiana—L. L. Stephens and L. L. Barkdull elected directors to succeed John D. Clark and to fill a vacancy.

The Texas Corp.—$5,000,000 additional $25 par shares listed on New York Stock Exchange, making total listing $211,243,150.

Northern Pipe Line Co.—Decrease in capital stock from $4,000,000 to $2,000,000 and par value of stock from $100 to $50 a share, approved by stockholders.

Transactions in Oil Shares on New York Stock Exchange

1927 High	1927 Low	1928 High	1928 Low	Listed Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended June 16 Sales	First	High	Low	Last	Change
7 3/8	2 7/8	38	27 1/2	(sh) 922,075	N.P.	Amerada Corp.	50cQ	Apr. 30, 28	19,500	30 1/4	32 1/2	29 3/4	32 1/4	+ 1 3/4
82 1/2	35 1/8	85	51 1/4	(sh) 209,180	N.P.	American Republics Corp.	.....	.....	22,700	57 3/4	61	52 1/8	57 1/8	— 1 3/4
50 1/4	35	46 1/2	37 1/2	$56,000,000	$ 25	Associated Oil	50cQ	Mar. 31, 28	490	50	50	45	45 1/8	+ 5/8
131 3/8	104	139 1/8	95 3/4	50,000,000	100	Atlantic Refining	$1Q	June 15, 28	73,400	117 1/2	128 3/4	110 1/4	126 1/4	+8 3/8
119	115 1/2	118 1/4	116	20,000,000	100	do pfd	$1.75Q	May 1, 28	100	118	118	118	118	0
35 1/2	20 3/4	26 1/8	22 1/4	28,725,675	25	Barndsdall Corp. A	.....	Feb. 6, 28	30,300	21 7/8	22 1/8	20	21 7/8	— 1/8
32 1/2	20 1/2	27 1/4	22	799,775	25	do B	.....	Feb. 6, 28	200	20	20 3/4	20	20 3/4	— 2 3/4
32 1/8	20	32 3/4	24	51,524,150	25	California Petroleum	25cQ	June 1, 28	200	27	27	27	27	— 2 1/2
96 3/4	65	94 1/8	71 1/4	20,785,400	100	General Asphalt	.....	.....	14,900	75 1/2	75 1/2	68	72 1/4	— 2 3/4
144 3/8	107 1/4	141 1/2	114	6,792,200	100	do pfd	$1.25Q	June 1, 28	4,700	117 1/2	118	110 1/4	114	— 3
175 3/4	60 1/8	167	127	25,000,000	100	Houston Oil	.....	.....	27,000	137	137	123 1/2	127	—10 1/4
32 3/4	17 3/4	31 7/8	21 3/4	(sh) 500,000	N.P.	Independent Oil & Gas	25cQ	May 7, 28	39,100	24 1/8	26 3/8	22 3/4	25	— 1/4
12 1/8	7 3/8	19 1/2	9	$3,280,340	$10	Indian Refining	.....	Dec. 15, 20	16,000	16 3/4	17 7/8	14 3/4	16 7/8	— 1/8
12	7 1/4	18 1/4	8 3/4	4,550,110	10	do ctfs	.....	.....	27,200	16 5/8	16 3/4	13 3/4	16	— 7/8
112	99	132 3/4	101	2,296,400	10	do pfd	.....	Dec. 15, 21	2,300	132	132 1/2	129	130	— 2 1/4
37 3/4	20 1/2	39 1/4	27 3/4	(sh) 3,992,122	N.P.	Lago Oil & Transport	75cQ	May 1, 28	5,500	31	33	30	33	+ 2 3/4
18 1/8	10	19 3/4	9 3/8	(sh) 1,237,078	N.P.	Louisiana Oil Refining	.....	.....	62,700	14 5/8	15 1/8	12 1/8	14 1/2	— 3/8
97	85 1/4	101	80	$4,000,000	$100	do pfd	$1 1/4Q	May 15, 28	1,200	101	*101	98 1/2	98 1/2	- 7/8
22 3/4	12	25 1/2	12 1/2	(sh) 330,000	N.P.	Maracaibo Oil	.....	.....	6,400	16	17	15	16 1/4	— 1/4
58 1/2	31	44 1/2	33	(sh) 2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	63,300	34 3/4	36 1/4	33	36 1/4	+ 1 1/2
320	200	360	255	$45,942,800	$100	Mexican Petroleum	$3Q	Apr. 20, 28	30	300	300	275	300	+15
....	....	....	....	12,000,000	100	do pfd	$2Q	Apr. 20, 28	....	....	....	....	....	....
9 1/4	3	39	4 3/8	sh) 945,939	N.P.	Mexican Seaboard	.....	Nov. 15, 24	104 400	23 3/4	25 3/8	19 3/8	23 1/8	— 3/4
39 3/4	25 1/2	33 1/4	25 1/2	(sh) 1,357,461	N.P.	Mid-Continent Petroleum	.....	Aug. 1, 27	13,600	28 1/2	29 3/4	27 1/2	29	0
105	97	115 1/8	103 1/4	$6,718,000	$100	do pfd	$1.75Q	June 1, 28	500	113 7/8	114	113 7/8	114	0
3 3/4	1 3/4	7 3/8	2 3/8	24,298,850	10	Middle States	.....	July 1, 23	57,300	4 3/8	5 1/8	3 3/8	4 3/8	— 1/8
2 3/4	1 3/8	5 7/8	1 1/2	5,501,370	10	do ctfs	.....	.....	5,700	3 1/2	3 7/8	3	3 1/2	— 1/8
1 7/8	1	2 1/4	1 1/4	(sh) 3,500,000	N.P.	Pacific Oil	.....	.....	34,800	1 3/8	1 5/8	1 1/4	1 1/2	+ 1/8
65 7/8	40 1/2	53 3/4	38 1/4	$48,807,400	$ 50	Pan American P. & T.	.....	Oct. 20, 27	5,700	43 1/4	43 1/2	39 3/8	43	+ 1/2
66 3/4	40 1/4	54 5/8	37 3/4	121,097,900	50	do B	.....	Oct. 20, 27	68,900	43 1/4	44 7/8	40	43 1/2	+ 1/4
37 7/8	16 3/4	28 3/8	18 1/4	(sh) 400,000	N.P.	Pan American Western B.	.....	Jan. 30, 27	12,600	20 1/8	21 3/4	18	20 1/8	+ 1 1/8
18 7/8	8	21 3/4	11 1/2	(sh) 198,770	N.P.	Panhandle P. & R.	.....	.....	14,800	15 3/8	16 7/8	13 1/8	14 3/4	— 1 1/4
83	54	106 1/4	70	$2,935,200	$100	do pfd	.....	July 2, 23	1,000	87	87	81 1/4	85 1/2	— 2 1/2
60 1/4	36 1/4	44 3/8	35 1/4	(sh) 2,406,796	N.P.	Phillips Petroleum	37 1/2cQ	Apr. 2, 28	39,000	38	38 5/8	36 1/2	38	0
1 1/8	1/2	4 1/4	1/2	$29,622,925	$ 25	Pierce Oil Corp.	.....	.....	52,900	2 1/4	3	1 3/4	2 3/8	+ 1/4
24	13 1/2	30 1/2	16 1/4	15,000,000	100	do pfd	.....	Feb. 1, 22	600	22	22	19	19	— 4
5 1/2	2 1/2	6 5/8	3 1/2	(sh) 2,500,000	N.P.	Pierce Petroleum	.....	.....	12,700	4	4 1/4	3 3/4	4	0
33 1/8	16 3/4	26 1/8	16	$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	20,100	23 3/4	24 3/4	21	24 3/4	+ 3/4
50	36 1/2	46 7/8	41	2,845,350	50	do pfd	.....	May 1, 25	240	44	44 7/8	44	44	— 1/4
33 1/2	25	27 1/2	19	75,959,250	25	Pure Oil Co.	12 1/2cQ	June 1, 28	28,900	22 3/8	23 1/2	20 7/8	22 5/8	— 1/8
115 1/2	111 1/4	115	108	13,000,000	100	do 8% pfd	$2Q	Apr. 1, 28	70	114	114	112 1/2	112 1/2	0
28 5/8	25 1/8	50 3/4	24	$29,224,894	$25	Richfield Oil	25cQ	May 1, 28	138,200	46	46 3/8	39 1/8	41 1/2	— 4 7/8
54 1/2	44 1/4	55	44 3/8	(sh) 611,303	13.40	Royal Dutch, N. Y. shares	$1.343	Jan. 28, 28	15,900	51 3/8	52 3/4	50 1/2	52 3/4	0
47 3/8	41 1/8	47	40 5/8	(sh) 77,590	£2	Shell Transport & T.	97c	Jan. 23, 28	400	44 5/8	45	44 5/8	45	0
31 3/4	24 3/8	31	23 1/4	(sh) 10,000,000	N.P.	Shell Union Oil	35cQ	Mar. 31, 28	41,300	26 1/8	27 1/4	24 7/8	27	+ 3/4
26 1/4	14 1/4	24 3/4	18 1/4	$7,208,080	$ 10	Simms Petroleum	.....	Apr. 1, 27	11,500	20 5/8	21 1/2	19 1/2	20 1/4	— 3/8
22 3/8	15	30 1/4	17 3/8	(sh) 4,501,915	N.P.	Sinclair Consolidated	.....	May 31, 24	210,900	22 1/2	24 3/8	21	23 5/8	+ 1 1/8
104 1/2	97	109 1/2	102 1/2	$16,604,600	$100	do pfd	$2Q	May 15, 28	100	107 5/8	107 5/8	107 5/8	107 5/8	— 7/8
37 3/8	24 1/2	34	25	27,396,590	25	Skelly Oil Co.	50cQ	June 15, 28	13,100	28	29 3/4	26 5/8	29	+ 1/2
60 1/4	50 1/8	63 7/8	53	(sh) 13,016,434	N.P.	S. O. California	62 1/2cQ	June 15, 28	57,300	56 1/2	58 1/8	52 7/8	56 5/8	— 1/8
41 3/8	35 1/8	49	37 3/4	$607,910,525	$ 25	S. O. New Jersey	‡25cQ	June 15, 28	3,800	42 5/8	45 1/4	40 3/4	44	+ 1 1/4
34 1/8	29 3/4	41 1/2	28 3/4	427,973,275	25	S. O. New York	40cQ	June 15, 28	252,300	33 3/4	36 5/8	31 5/8	35 1/2	+ 2 1/8
34 1/2	30	49	31 1/2	(sh) 1,206,073	N.P.	Sun Oil	25cQ	June 15, 28	4,900	42 1/8	43 1/2	40	43	0
101 3/8	99	109 1/2	100	$5,000,000	$100	do pfd	$1.50Q	June 1, 28	....	....	....	....	....	....
6 1/2	3 1/4	9 1/2	2 1/8	(sh) 1,121,368	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	83,000	7 1/8	7 1/4	5 1/4	6 3/4	— 1/2
58	45	66 5/8	50	$180,480,550	$ 25	The Texas Corp.	75cQ	Apr. 2, 28	144,000	58 1/4	60 3/8	55 1/4	59 3/8	+ 3/4
18 3/4	12	17 1/2	12 1/8	8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	28,400	14 1/8	14 1/8	13 1/8	13 3/8	— 1/2
29 1/4	19	27 1/8	19 5/8	(sh) 2,168,410	N.P.	Tide Water Oil Co.	20cQ	Mar. 31, 28	800	24	24	23	23 7/8	+ 1/8
90 1/2	85	94 1/2	87	$20,705,200	$100	do 5 1/2% pfd.	$1.25Q	May 15, 28	1,500	88	90	88	89	+ 1
19 1/2	15 3/4	20 5/8	14 3/4	(sh) 4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	47,800	16 5/8	16 7/8	15 3/8	16 3/8	— 3/8
90 3/4	85	90	82 1/2	$72,745,900	$100	do pfd	$1.50Q	Apr. 2, 28	600	85 1/2	86	85	85	— 2 1/2
10 1/8	3 3/4	10 1/8	7 1/4	(sh) 3,742,029	N.P.	Transcontinental Oil	.....	.....	100,900	7 1/2	7 7/8	6 3/4	7 1/2	— 1/8
56 1/2	39 5/8	57	42 3/4	$40,791,225	$ 25	Union Oil of California	50cQ	May 10, 28	35,400	49 1/2	50	45 1/8	48	— 2
127 1/2	94	128 1/8	119 1/4	30,844,000	100	Union Tank Car Co.	$1.25Q	June 1, 28	500	118 3/4	118 3/4	115 1/4	116 1/4	— 4 3/4
34 1/2	24 1/2	33 1/2	26	(sh) 310,956	N.P.	Warner Quinlan	50cQ	Apr. 1, 28	48,400	36 1/4	37	32 1/8	36	— 1/4
27 1/2	20	26	20 1/8	(sh) 490,000	N.P.	White Eagle Oil & Refining	25cQ	Apr. 20, 28	3,400	21 1/2	22 1/2	21 3/8	22 1/4	— 1/4

*New High †New Low ‡Also extras s-Stock Total Sales 2,135,430

Pittsburgh Stock Exchange

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Week Ended June 15 Sales	First	High	Low	Last	Change
....	....	4	2 1/2	N.P.	Ark. Nat. Gas (new)	11,707	3	3	2 3/4	3	— 1/8
....	....	7 1/2	6 3/4	N.P.	do pfd	10,862	7 3/8	7 1/2	7	7 3/8	0
98 3/4	80 7/8	114 1/2	90 3/4	100	Columbia Gas	50	102 3/4	102 3/4	102 3/4	102 3/4	—11 3/4
107 7/8	100	108 1/2	108	100	do pfd	....	....	....	....	....	....
15	7 1/2	10	7	10	Devonian Oil	85	8	8	8	8	— 1/4
....	....	15	9 3/4	10	Dixie Gas & Util.	70	13	13	12	12	— 1
....	....	95	85	100	do pfd	....	....	....	....	....	....
117 1/2	115	116	115	100	Duquesne Light pfd.	....	....	....	....	....	....
....	....	85	80 1/2	100	Fayette County Gas.	....	....	....	....	....	....
12 1/4	6	22	12	N.P.	Houston Gulf Gas	10	17	17	17	17	— 1
59 1/4	37 1/4	58	48 5/8	$ 25	Lone Star Gas	7,315	52	52 3/4	49	51 1/2	— 1 1/2
....	....	36 1/2	36 1/2	25	Petroleum Exploration	....	....	....	....	....	....
3 1/8	3	4	3 1/4	5	Pittsburgh Oil & Gas	60	3 1/4	3 1/4	3 1/4	3 1/4	0
8	5 1/2	7 1/4	6	10	Salt Creek Cons.	63	6 1/4	6 1/4	6	6	0
26 1/2	17	22	16 3/4	10	Tidal Osage	....	....	....	....	....	....
43	33	33 1/4	30 1/2	N.P.	Waverly Oil Wks. A	....	....	....	....	....	....
....	....	19	18	$ 25	Wiser Oil	18	18	18	18	18	— 1

Pittsburgh Curb Exchange

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Week Ended June 15 Sales	First	High	Low	Last	Change
....	....	10 1/4	9	10	Ark. Nat. Gas (old)	1,000	9 1/2	9 1/2	9 1/2	9 1/2	— 1/2
95	88	132	132	25	Gulf Oil	....	....	....	....	....	....
....	....	115	115	....	Houston Gulf Gas pfd.	....	....	....	....	....	....
10 3/4	5 1/2	9	5 1/2	25	Leonard Oil & Dev.	....	....	....	....	....	....
2.70	.30	1.00	.50	10	Omar Oil & Gas	....	....	....	....	....	....
2 1/4	1 3/4	....	....	5	Pittsburgh Oil Dev.	....	....	....	....	....	....
31	19	22	16 3/4	5	Plymouth Oil	238	20	20	18	18	— 2
6	5	4 3/4	4 1/2	5	States Oil	....	....	....	....	....	....
3 1/4	1 1/2	4 1/2	2 1/4	1	Texon Oil & Land	2,714	4	4	3 3/8	3 3/8	— 3/8
23 3/4	18	18	15	10	Tidal Osage Non-vgt.	....	....	....	....	....	....

*New High †New Low x Ex Dividend

Oil Company Earnings

Annual	1927	1926
Anglo-American Oil Co.	£ 208,213	£1,635,235
Shell Trans. & Trading	5,369,695	5,361,512

Oil Dividends

	Amount	Payable	Stock Record
Gulf Oil q	37 1/2c	July 1	June 20
International Pet. q	25c	June 30	June 23
Lone Star Gas q	50c	June 30	June 20
New England Fuel q.	25c	July 2	June 20
Paragon Ref. pfd. q.	75c	July 1	....
Washington Oil q.	81	June 20	June 14
White Eagle Oil q	25c	July 20	June 29

Cleveland Stock Market

June 15	Par Value	Bid	Asked	Last Sale
Canfield Oil	100	..	115	115
do pfd	100	100	..	100
Fred G. Clark	10	4 1/2	5	5
National Refining Co.	25	35 1/2	37 1/2	38
do pfd	100	x130	135	132 1/2
Paragon Refining Co.	25	13	13 1/4	13
do pfd	100	122	128	120

xEx. Dividend

Standard Oil Stocks on New York Curb

1927 High	1927 Low	1928 High	1928 Low	Outstanding Capital	Par Value	Stocks	Div. Rate	Last Paid	Transactions Week Ended June 16 Sales	First	High	Low	Last	Change
21⅝	17⅞	22⅛	17	£ 4,126,460	£ 1	Anglo-American Oil	24.4c	June 6, 28	4,000	17¼	17⅞	†17	17⅞	+ ⅛
21½	17⅝	20⅛	16½	.....	£ 1	do cts. non-voting	.....	.....	3,500	17	17	16½	16½	— ½
3¼	¾	5	1¼	(sh) 500,000	N.P.	Atlantic Lobos	.....	.....	700	3¼	3¼	2¾	2¾	— ⅜
6½	2½	9¾	3¼	$ 10,000,000	$ 50	do pfd	.....	.....	700	6⅝	6⅝	5	5	— 1⅜
69	50	56	49	1,000,000	25	Borne Scrymser	‡$1S.A.	Apr. 16, 28	150	51	51	51	51	+ ¼
60	45	76	58	10,000,000	50	Buckeye Pipe Line	‡$1Q	June 15, 28	900	65⅝	65⅝	63	65¼	— 1¼
126	76½	161	117¼	3,000,000	25	Chesebrough Mfg	$1Q	Mar. 30, 28	100	136¾	136¾	136¾	136¾	—13¼
22⅝	16¾	23	16	36,057,840	10	Continental Oil	.....	Dec. 15, 27	16,000	16⅝	17	16	16⅜	— ⅛
137	89	114	88	3,000,000	100	Cumberland Pipe Line	‡$2Q	June 15, 28	50	98	98	98	98	— 1
68½	47	88	64¼	5,000,000	100	Eureka Pipe Line	$1Q	May 1, 28	50	72¼	72¼	72¼	72¼	— 1
13½	3¼	11	5	16,000,000	100	Galena Signal Oil	.....	June 30, 25	800	7	7½	7	7½	+ ½
59¾	23	39	27	4,000,000	100	do new pfd	.....	June 30, 26	30	33	35	32½	35	+ 2½
60⅛	35⅛	48	35	2,000,000	100	do old pfd	.....	June 30, 26	110	45	45	45	45	0
68½	54	84¾	60	73,117,577	25	Humble Oil & Refining	‡30cQ	Apr. 1, 28	40,200	76¾	79	72¾	77½	+ 1
182	123¾	245	176½	20,000,000	100	Illinois Pipe Line	‡$6S.A.	June 15, 28	900	216¼	216¼	211	212	—12
64¾	37¾	71⅞	56¾	(sh) 6,488,267	N.P.	Imperial of Canada	‡25cQ	June 1, 28	8,900	65½	66½	62¾	65½	0
94½	61	89½	74⅞	$5,000,000	$ 50	Indiana Pipe Line	‡$1Q	June 15, 28	100	80	80	80	80	— 4
39	28¼	45¼	35	(sh) 17,123,444	N.P	International Petroleum	25c	Mar. 15, 28	65,900	38¾	40⅝	37	39¾	+ 1¾
24	13¼	32⅜	19⅜	$6,363,350	12.50	National Transit Co	‡25cQ	June 15, 28	3,400	21⅜	22	†19⅜	21¾	+ ⅜
44½	31¾	59⅛	37½	5,000,000	100	New York Transit	.....	July 15, 26	.....	.....	.....	.....	.....	.....
100	70	125	94	4,000,000	100	Northern Pipe Line	‡$3S.A.	Jan. 1, 28	200	116	116	110	110	— 8½
67⅛	52	68¼	58	60,000,000	25	Ohio Oil Co	‡50cQ	June 15, 28	5,000	62⅛	62⅞	60⅞	62	0
39	12	84	28	10,000,000	25	Penn Mex. Fuel	$1 25	May 31, 28	2,500	45	45	†28	41½	— 6½
190	132	223	184	81,000,000	100	Prairie Pipe Line	$2.50Q	Apr. 30, 28	1,350	215½	215½	211¾	213¼	— 2¼
55½	45⅜	56	47⅝	60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	17,300	49⅛	51	48	50¼	+ 1⅜
201½	175½	186	167	4,000,000	100	Solar Refining	$5S.A.	June 20, 28	.....	.....	.....	.....	.....	.....
27¼	15½	35⅞	21	5,000,000	50	Southern Pipe Line	$2	Dec. 1, 27	.....	.....	.....	.....	.....	.....
41¼	35	53	36¾	20,00,000	25	South Penn Oil	50cQ	Mar. 31, 28	6,400	45⅛	47	38⅝	46¾	+ 1¾
83	55½	100⅜	70	3,500,000	100	South West Pa. Pipe Lines	‡$1Q	Apr. 2, 28	550	98	100	97	97	0
81½	64¾	83⅜	70⅞	228,415,463	25	S. O. Indiana	‡62½cQ	June 15, 28	28,400	75¼	77½	72⅜	76⅛	+12
20⅞	14⅜	27½	15	8,000,000	25	S. O. Kansas	.....	June 16, 24	7,700	21	21	17	20	— ¼
130	111½	136⅛	122¼	17,012,559	25	S. O. Kentucky	$1Q	Mar. 31, 28	10,400	127½	127¾	123	124	— 3½
49½	40	45⅞	39⅞	4,559,850	25	S. O. Nebraska	62cQ	June 20, 28	1,100	42	42	41¼	41¼	— ¾
87½	72	79½	71	14,000,000	25	S. O. Ohio	62½cQ	Apr 2, 28	500	75	75	72⅜	72⅜	— 2⅞
122	117¼	125	117	7,000,000	100	do pfd	$1.75Q	June 1, 28	30	120	120	120	120	+ ¼
21	14½	26	16	30,734,000	25	Swan Finch Co	.....	Nov. 1, 19	300	22	22	20	20	— 2
.....	.....	87⅛	72	124,941,600	25	Vacuum Oil	75cQ	June 20, 28	25,300	77¾	78⅛	†72	76	— 1

•New high †New low xEx dividend ‡Also extras.

New York Curb Bonds

Week Ending June 15

	High	Low	Last	Ch'ge
Beacon Oil 6s '36	103	101⅛	103	+1⅞
Cities Serv. 5s '66	97¾	97¼	97½	0
Cities Serv. 6s '66	104⅛	103¾	104	0
Cities Serv. G. 5½s '42	94½	94	94¼	0
Cont. Oil 5¼s '37	96⅞	96½	96½	— ½
Empire O. & R. 5½s '42	93¾	93½	93½	— ¼
Galena S. O. 7s 30	94½	93½	93½	— ½
Gulf Oil 5s '37	101⅛	100	100⅛	—1
Gulf Oil 5s '47	100¾	99¾	100½	— ¼
Indep. Oil 6s '39	100½	98	100	0
Richfield Oil 6s '41	129½	115	124	—10
Richfield Oil 5½s	100½	100	100	— ½
Sun Oil 5½s '39	101¼	101⅛	101⅛	— ⅛
Tidal Osage 7s '31	.....	.....	.....	.....
Trans. Cont. Oil 7s '30	104½	103½	104¾	— ¼
Warner Quinlan 6s '42	110½	105½	107½	—2⅜

New York Bonds

Week Ending June 15

	High	Low	Last	Ch'ge
Asso. Oil gold 6s	102½	102½	102½	0
Atlantic Refg. deb. 5s	102	101⅜	102	+ ½
Barnsdall Corp. 6s	101½	99¾	101¼	+ ¼
Barnsdall Corp. 8s ex-war.	91⅞	90	91¼	— ½
Cal. Pet. 5s	98	97¾	98	— ½
Cal. Pet. 5½s	101¾	101	101	0
General Asphalt 6s	109	107½	108	—1
General Petroleum 5s	101⅝	101¼	101¼	— ¼
Humble Oil & Refg. 5½s.	101¼	100⅝	101⅛	+ ½
Humble Oil & Refg. 5s	100	98	99½	+ ¼
Mid-Cont. Pet. 6½s	105¾	105¼	105⅜	— ⅛
Pan Amer. P&T 7s	105	104½	104⅞	+ ⅜
Pan Amer. P&T 6s	103½	102¾	103½	+ ⅜
Pan Amer. P&T 6s	98¼	97	97¼	— ¾
Phillips Pet. 5½s	92½	91½	92¼	— ¼
Pierce Oil deb. 8s	105½	105½	105½	+ ¾
Pure Oil 5½s	98½	98⅜	98⅜	— ½
Shell Union 5s	97¾	96½	97¼	— ½
Simms Pet. cvt. 6s	102⅝	101½	101½	— ½
Sinclair Con. Oil 7s	102	100	102	+ ⅞
Sinclair Con. Oil 6½s	99½	99	99½	0
Sinclair Con. Oil 6s. D	98¾	98¼	98¼	— ¼
Sinclair Con. Crude 5½s.	98¼	96½	97¼	+ ¼
Sinclair Pipeline 5s	94⅛	93¼	94⅛	+ ⅛
Skelly Oil 5½s	94	93	93½	+ ½
S.O.N.Y. 4½s	97	95¼	96¼	— ⅜
S.O.N.J. deb. 5s	103¼	103	103⅛	0
Union Oil of Calif. 6s A	109½	109	109	—1⅜
Union Oil of Calif. 5s C	99⅞	99⅜	99⅞	+ ¼
White Eagle 5½s War	96¾	96½	96¾	+ ¼

Independent Oils on New York Curb

1927 High	1927 Low	1928 High	1928 Low	Par Value	Stocks	Transactions Week Ended June 16 Sales	First	High	Low	Last	Change
2⅞	.55	1½	.75	$ 5	Amer. Con. Oilfields	57,000	1	1 1/16	75	96	— 1/8
7½	2¾	6⅝	3⅛	N.P.	Amer. Maracaibo	13,000	5	5	3⅞	5	0
2¾	1	4	2¼	$ 10	Argo Oil	100	3	3	3	3	+ ⅜
9¾	6¾	10¼	7⅜	10	Arkansas Nat. Gas	200	9⅝	9¾	9⅝	9¾	0
20½	15½	....	....	N.P.	Beacon Oil	.....	.....	.....	.....	.....	.....
40	20½	40½	32¾	N.P.	British American	10o	36⅛	36⅛	36⅛	36⅛	+ 7½
28¼	15½	23⅞	17⅞	25c	Carib Syndicate(new)	7,900	21¾	21¾	†17⅞	18¾	— 1½
26	15⅜	....	....	....	do ctfs. of deposit	.....	.....	.....	.....	.....	.....
58¾	40¼	71¼	54	$ 20	Cities Service	62,100	70⅛	70⅛	63¼	67⅞	— 1⅞
95⅜	87	103½	94½	100	do pfd	500	102⅜	102⅝	101⅝	102	— ⅝
8⅞	7⅜	9⅝	8⅞	10	do pfd. B	100	9½	9½	9½	9½	0
29¼	22½	34⅝	28¼	10	do banker's shares	.....	.....	.....	.....	.....	.....
3⅞	1⅜	2¼	1⅛	1	Colombia Syndicate	17,100	1¾	1¾	1⅜	1½	— ⅛
9¾	6¾	8⅜	6½	10	Consolidated Royal	.....	.....	.....	.....	.....	.....
14⅞	9½	17½	10	N.P.	Creole Syndicate	82,500	13¾	13⅞	12	13⅜	— ⅜
3	.50	3½	.76	N.P.	Crown Central	6,500	2⅛	2⅜	1⅝	2	— ⅛
12	4	30⅛	8⅛	N.P.	Darby Petroleum	6,700	24⅜	24¾	19½	23½	— ½
11½	4	13½	7⅞	....	do trust ctfs.	.....	.....	.....	.....	.....	.....
2½	.74	22	1	N.P.	Derby Oil & Refining	1,000	1½	1½	1	1	— ½
16¾	4	11⅛	7½	N.P.	do pfd	10	11	11	11	11	0
3¾	1	2	1	N.P.	Gibson Oil	29,600	1¼	1⅜	†	1¼	0
2	.40	.53	.15	N.P.	Gilliland ctfs.	.....	.....	.....	.....	.....	.....
118	86¼	148½	101⅛	$ 25	Gulf Oil Corp	18,900	126¼	128	115	128	+ 13¾
2½	.80	7⅞	1	10	Intercontinent Pet	20,300	1⅜	1¾	†1	1⅜	— ⅜
2¼	1⅜	3	1¼	N.P.	Kirby Petroleum	.....	.....	.....	.....	.....	.....
10⅞	5⅛	9⅜	5½	N.P.	Leonard Oil & Dev.	8,000	7½	7½	6½	7	— ½
27½	20	32⅜	20	N.P.	Lion Oil & Refg.	2,800	20	30½	25½	29	+ ½
59⅜	37	57	48⅝	$ 25	Lone Star Gas	6,500	52	53	†48⅜	51½	+ 1¼
2⅞	.80	1⅞	.91	1	Magdalena Synd	32,600	1¼	1¼	91	1¼	0
21½	20⅞	22⅛	22⅛	N.P.	Manhattan Oil	.....	.....	.....	.....	.....	.....
52	12	45	36½	N.P.	Margay Oil	100	36½	36½	†36½	36½	— 2
3	1½	40½	40½	$ 10	Mexican-Panuco	.....	.....	.....	.....	.....	.....
12⅛	5	8	4¼	N.P.	Mexico-Ohio Oil	900	5⅞	5⅞	5½	5⅞	+ ¼
1½	1	1½	.81	$ 1	Mountain & Gulf	7,100	84	89	82	88	+ 4
29¼	22¾	28⅝	23	10	Mountain Producers	6,100	24	24½	23¼	23¼	— ⅝
5⅞	4⅝	5⅝	4¾	5	New Bradford	2,600	5¼	5⅛	5	5	— ⅛
6¼	4	5½	4	10	New England Fuel	100	4⅞	4⅞	4⅞	4⅞	— ⅛
16	9¼	11⅜	8	1	New Mex. & Ariz	1,900	8⅜	8⅜	†8	8⅛	— ¼
13⅞	9	15½	11½	25	New York Oil	.....	.....	.....	.....	.....	.....
12¾	9½	13¼	10¾	N.P.	North Cent. Texas	900	12	12	11¾	12	— ½
23⅞	21¼	...	...	...	Okla. Nat. Gas ctfs.	.....	.....	.....	.....	.....	.....
9⅜	3¼	6	2⅝	N.P.	Pandem	2,800	3	3	2⅝	2⅞	— ⅛
12⅛	7	15¼	8½	N.P.	Panapec Oil	2,700	11½	11⅝	10¼	11½	— ⅛
9	7⅝	11⅝	10⅝	$ 25	Paragon Refg.	....	....	....	....	....	....
.37	.25	9	4	N.P.	Peer Oil Corp.	.....	.....	.....	.....	.....	.....
13½	5⅛	7¾	5⅛	10	Pennok Oil	300	5¼	5½	5½	5½	— ½
....	....	4⅛	3¼	5	Pittsburgh Oil & Gas	.....	.....	.....	.....	.....	.....
24¾	7	14½	9	25	Red Bank Oil	200	9⅜	9⅜	9½	9½	0
15½	3½	12⅞	4⅛	N.P.	Reiter-Foster	7,900	7¼	7½	6¾	6⅞	— ⅜
28⅜	15	31½	22	$ 25	Richfield Oil pfd	1,100	24⅛	24⅛	23½	23½	— ⅝
7	4½	9⅛	4⅝	N.P.	Ryan Consolidated	1,500	6⅞	6⅞	5⅜	6⅝	— ¼
8	5¼	7¼	6	$ 10	Salt Creek Cons	2,300	6	6⅜	6	6	0
35½	27¼	35	27½	10	Salt Creek Prod	2,600	27⅜	28⅜	27¼	28⅜	+ ⅝
7	1¼	3½	1	5	Savoy Oil	.....	.....	.....	.....	.....	.....
26⅛	17	22⅞	13	10	Tidal Osage	1,600	18½	18½	17	17⅞	— 1½
23¾	15	21¾	13½	10	do non-voting	1,800	17¾	18¾	16⅛	17	— ⅛
92	63½	87	82	100	Transcontinental pfd.	....	....	....	....	....	....
23¼	7	47	18	10	Venezuela-Mexico	.....	.....	.....	.....	.....	.....
7⅜	4¼	6⅝	4⅞	5	Venezuelan Petrol	4,400	5⅜	5¾	5⅜	5½	— ¼
32⅝	19½	25	18⅞	N.P.	Wilcox Oil & Gas	100	19½	19½	19½	19½	0
8	4¾	8¼	5¾	$ 1	Woodley Petroleum	200	6½	6½	6½	6½	— ¾
6	1¾	8⅜	2⅜	25	Y Oil & Gas (new)	1,800	5⅛	5¼	3	4⅞	— ¼

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$4 in Canada
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Trade Mark reg. U.S. Pat. Off.
Members of Audit Bureau of Circulations and Associated Business Papers, Inc

NATIONAL PETROLEUM NEWS

Branch Offices:
LOS ANGELES
Petroleum Securities Building
TULSA.
World Building
NEW YORK
342 Madison Avenue
HOUSTON
612 West Building
CHICAGO
35 Wacker Drive

Published by the National Petroleum Publishing Co. MAIN OFFICE · 1213 W. 3rd St., Cleveland, Ohio. Copyrighted 1928

Vol. XX Cleveland, Ohio, June 20, 1928 No. 25

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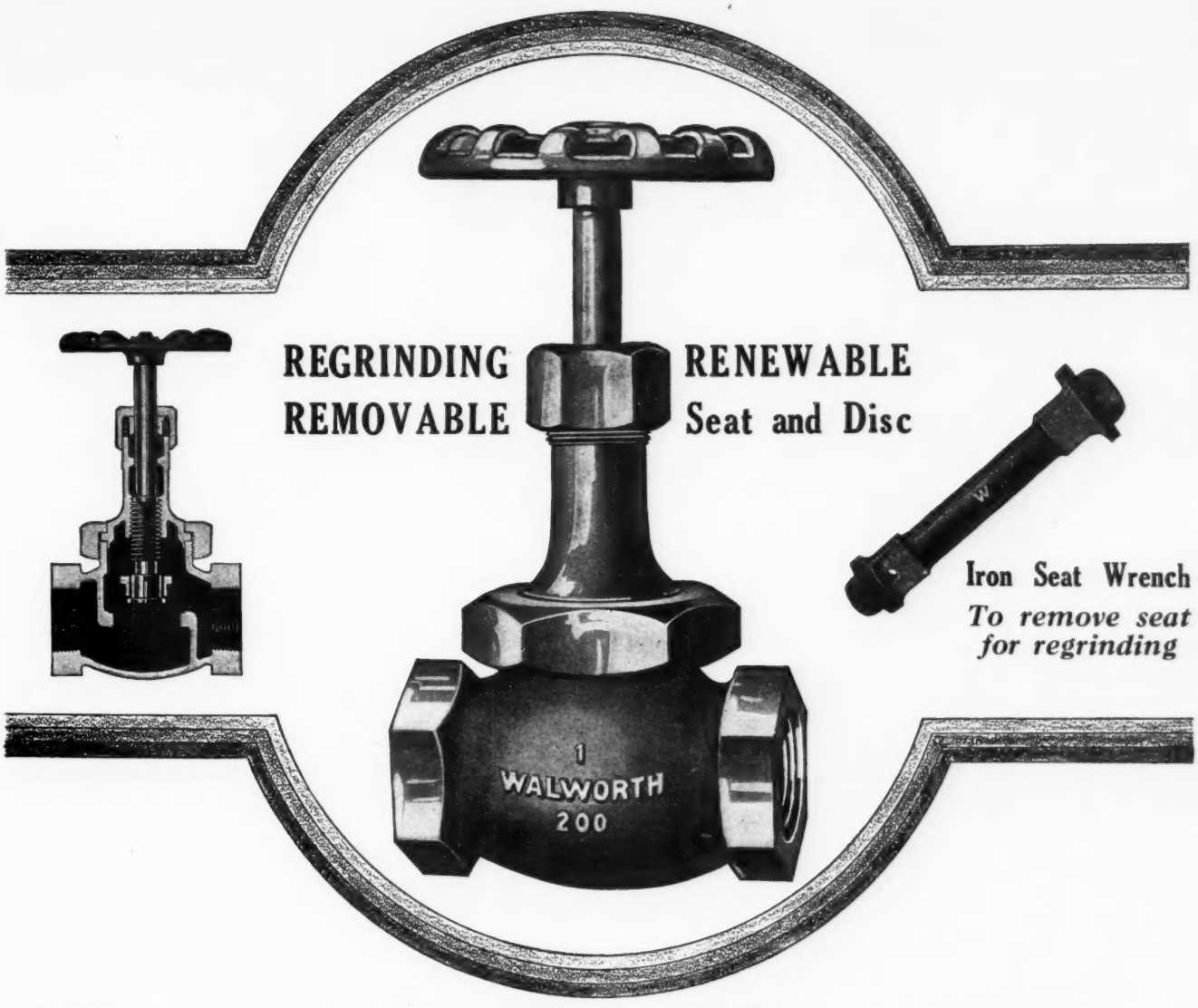

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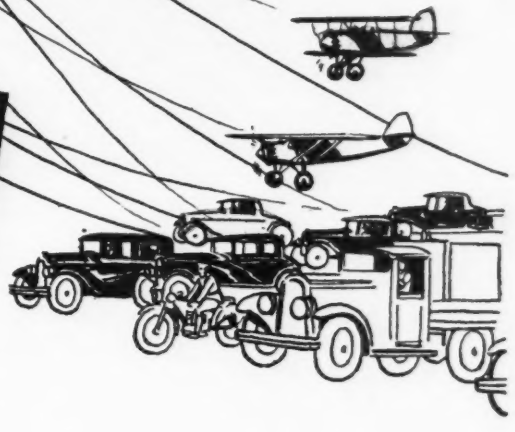
MILWAUKEE

Volatility



Like the skilled but unseen hands that control the Marionettes as they bow and dance and move about the stage, so *volatility* controls engine performance.

Likewise, the skilled men of the Phillips research department have learned to *control volatility*—to put the component parts of Natural Gasoline together correctly—to obtain Controlled Volatility for the season, the climate and the atmospheric pressure.

To make natural gasoline obey, and give the motorist a fuel with pep, power and easy starting is a Phillips achievement.

> "Phillips 66" is just such a motor fuel—different and better—a correct combination of refinery gasoline with certain *parts* of natural gasoline—a product proved by actual use—highly volatile yet stable.

The same controlled volatility found in "Phillips 66" may also be obtained by jobbers and refiners in their own motor fuels by the correct use of the correct Phillips Natural Gasolines. The knowledge and experience of our research department is available on such problems.

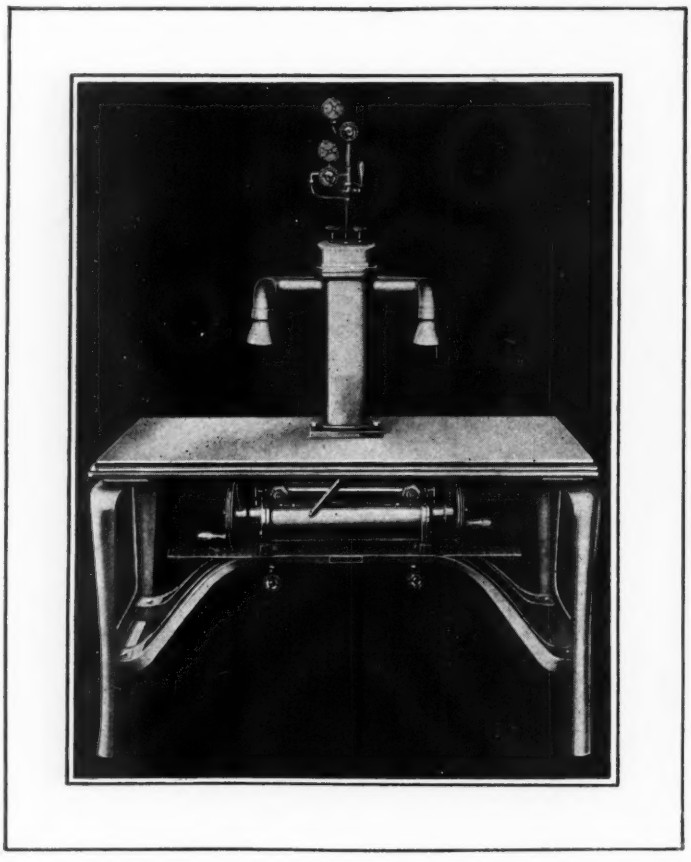
Phillips Petroleum Company

Bartlesville, Oklahoma

NATURAL GASOLINE FOR CONTROLLED VOLATILITY

Phillips 66

THE FEE MACHINES



3. *Accurate Weighing and Filling Saves Time*

RADICALLY different in operation is the Fee Weighing and Filling Machine (Low Pressure Type) as compared to the usual hand methods of filling viscous materials such as lard, grease, peanut butter, medicinal salves and creams, jam, mayonnaise, etc., into packages.

Instead of partially filling a container, weighing it on a scale, making up full weight by adding a spatula or two more of product, and then wiping off the drip or overflow, the Fee machine operator merely places empty containers alternately under each spout, and removes the filled, but not overflowing package.

The Fee machine *accurately* measures out exactly the weight of product for each package and deposits it quickly and smoothly at practically atmospheric pressure in the container. That's all there is to it. No need to check weights; the quantity is right the first time. No need to add or take away a little with a spatula. And nothing to wipe off afterwards.

The time saving is enormous, to say nothing of the fact that no particular skill on the part of the operator is required.

And if you want to fill another product, the machine is quickly and easily cleaned by simply blowing compressed air or steam through the pipes for a minute or two!

When making inquiry, please tell us the nature of your product and the sizes of packages you are using.

AMERICAN MACHINE & FOUNDRY CO.
Sales Offices, 511 Fifth Ave., New York City
Works, 5502-5520 Second Ave., Brooklyn, N.Y.

AUTOMATIC MACHINERY

"It'll only take a second with this pump, Doctor Johnson"

EVERY second counts. But there's no delay at this station, for G & B Visibles do their work quickly. Their speed and accuracy serve motorists without the loss of precious time.

Each feature of G & B Visibles is designed to draw and hold customers. The genuine "Nultra" bowl—the semaphore signal—the fast, dependable pumping unit—the G & B Progressive Method of Delivery, all play an important part in building business and in selling more gasoline.

Supply your dealer with G & B Visibles and help him establish a reputation for speedy, satisfactory service.

Write for Bulletin T-176 describing nozzle control sight measure type; or for Bulletin T-179 telling about mechanical measure models.

GILBERT AND BARKER
MANUFACTURING COMPANY
PUMPS AND TANKS FOR THE OIL TRADE
SPRINGFIELD MASS. U.S.A.

ANNOU

The

Interna

Petroleum

TULSA, OKLA. U.S.A.

The Fifth International Petroleum Exposition and Congress is attracting universal interest throughout the Industry. The associations in the Industry have endorsed the Exposition 100%. Manufacturers and distributors have rushed reservations at such a rate that more than 70% of the available exhibition space was contracted for on June 25th.

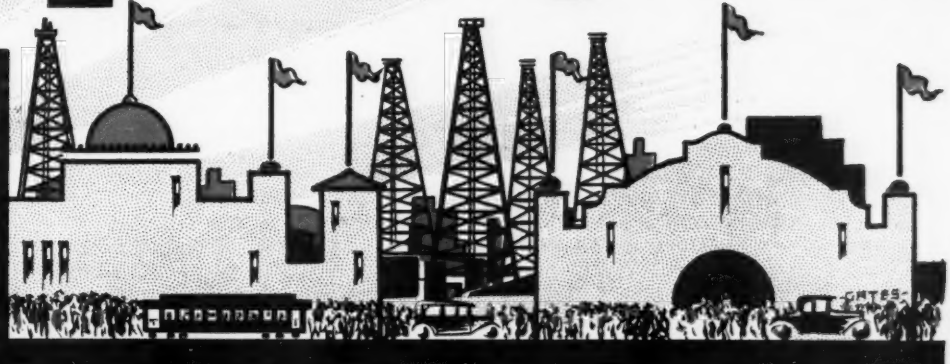
A larger plant, better traffic arrangements, more parking space, and the absence of side shows and distractions will make the coming Exposition the greatest oil and gas show ever held.

THE WORLD'S FAIR OF

UNCING!

The 5th

national Exposition



A. OCT. 20-29, 1928

The Exposition is the only occasion upon which manufacturers and distributors of oil industry equipment can show their products to a maximum number of buyers at one time and place. It offers users and buyers of equipment unparalleled opportunity for convenient study of the latest in machinery and methods. Strictly a business show, the 1928 Exposition will be conducted for utmost value to exhibitors and visitors alike.

Those desiring exhibition space should make reservations at once. Write or wire, J. Burr Gibbons, General Manager, Bliss Building, Tulsa, Okla.

OF THE OIL INDUSTRY

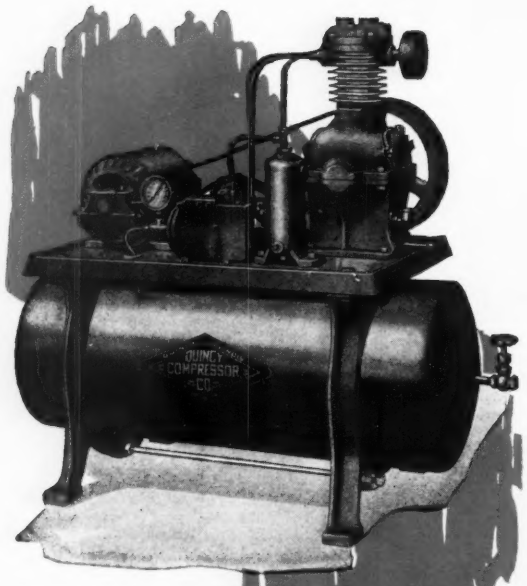
"Healthy" Filling Stations

When filling stations don't grow, they're ailing. When business begins to slip down the street to competitors—they're sick!

But business can be signalled, stopped, and made to turn right in to any filling station by offering better service—service with a smile and with plenty of air pressure to back it up. Thorough greasing and washing, done by compressed air, help bring in business and profits.

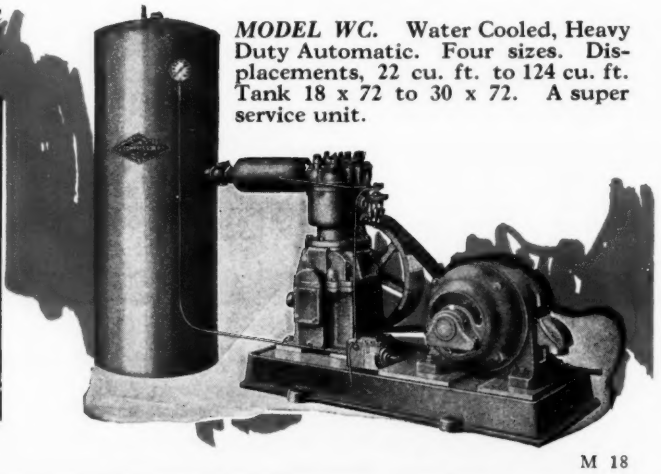
Quincy Compressors, with their long-lived, trouble-free service, will hold your old business while acquiring new. Quincy units, according to the men who use them, are helping to raise many small stations to the "super" class.

The coupon will bring the entire story of Quincy's sturdy air and water cooled models. Be sure to get it.



MODEL F-1. Single-stage Automatic Unit. ½ H.P. Standard Motor. Tank 14 x 36—24 Gallon, fully insured. 140 lb. Cut-Out Pressure. 2.8 cu. ft. Displacement. ¼ H.P. Motor for 4 cu. ft. or 150 lb. Cut-Out Pressure.

MODEL G-16. Two-stage Automatic Unit. ¾ H.P. Standard Motor. Tank 14 x [illegible]—30 Gallon, fully insured. 175 lb. Cut-Out Pressure. 3½ cu. ft. Displacement. 1 H.P. Motor for 7 cu. ft. or 200 lb. Cut-Out Pressure.



MODEL WC. Water Cooled, Heavy Duty Automatic. Four sizes. Displacements, 22 cu. ft. to 124 cu. ft. Tank 18 x 72 to 30 x 72. A super service unit.

QUINCY COMPRESSOR CO.
223 Maine St., Quincy, Ill.

Please send me the complete story of Quincy Compressors.

Name.....

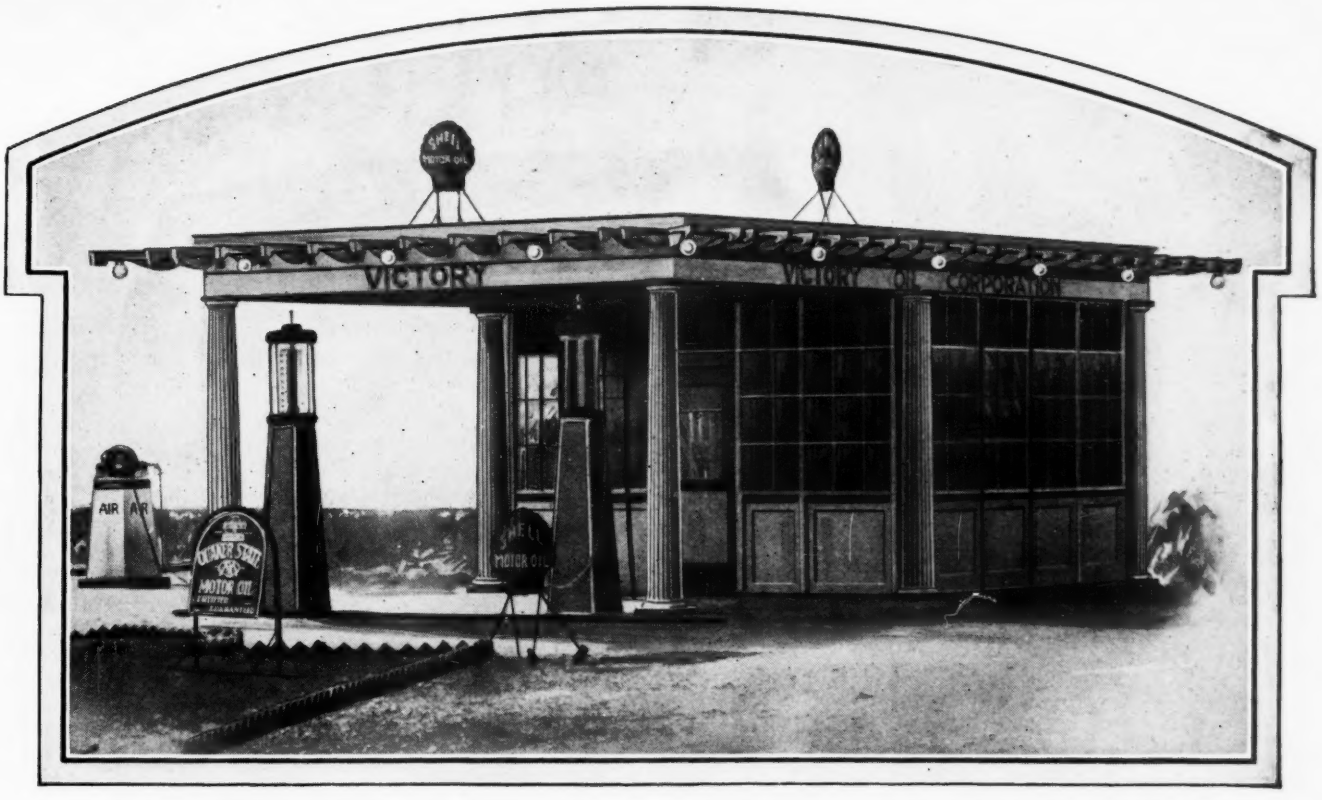
Address.....

City.....State.....

M 18

QUINCY COMPRESSOR CO.

Quincy QUINCY ILL. QUINCY C.O. COMPRESSOR U.S.A. Illinois



"We Have Changed Our Minds"

writes one customer

MANY filling station operators think that it is necessary to invest thousands of dollars in a permanent station in order to get a building of pleasing appearance and lasting quality.

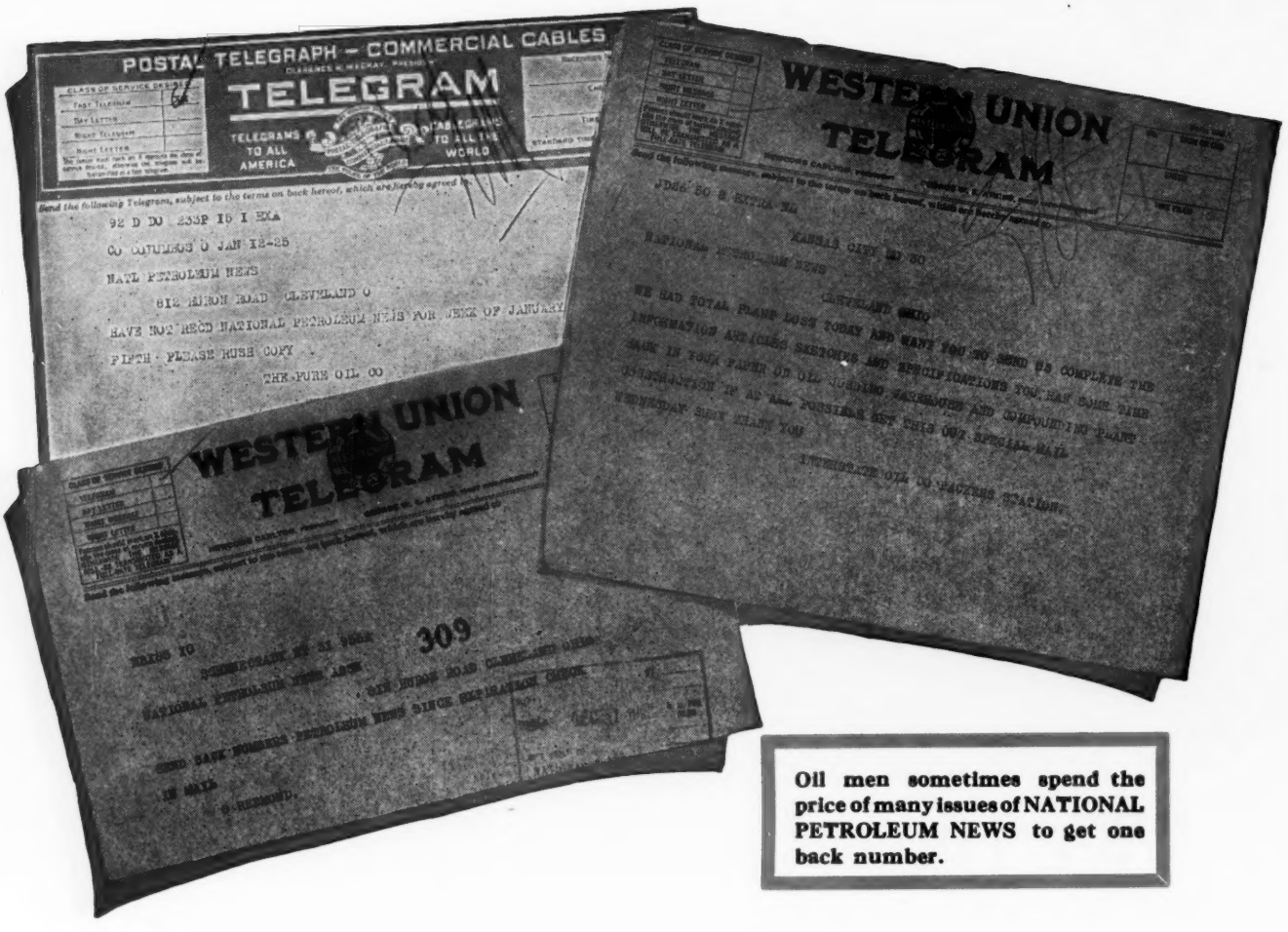
But just read what Mr. P. S. Rutledge, President of the Victory Oil Corporation of Goodland, Kansas, wrote after buying a Union Metal Ornamental Filling Station: "Like many others, we had almost decided that a portable station did not have the snap of brick, stucco and other types, but we have changed our minds, and I am safe in saying that no one can erect a station of other construction having the same appearance and architectural design as a Union Metal Station at a cost of less than $3,000 to $3,500. Then, too, the mobility of a portable building adds a value of at least one-third when it comes to leasing locations for stations."

This letter is even more remarkable when it is considered that the Victory Oil Corporation wrote for our catalogue, mailed in their order, and erected the building without any assistance whatsoever from us.

Before you place your order for another building, send for the new Union Metal catalogue. In it you will find a size and type of station that will adequately meet your requirements.

THE UNION METAL MANUFACTURING CO.
General Offices and Factory: Canton, Ohio.
Branches—New York, Chicago, Philadelphia, Boston, Cleveland, Pittsburgh, St. Louis, Los Angeles, San Francisco, Jacksonville

UNION METAL
ORNAMENTAL FILLING STATIONS



Oil men sometimes spend the price of many issues of NATIONAL PETROLEUM NEWS to get one back number.

They Burn the Wires for a Copy!

WHY? Because the news it contains must be timely and its information valuable to oil men in every division of the industry—producing, refining and marketing.

More oil men read ***National Petroleum News*** than any other oil paper.

Every reader pays for his subscription in advance. No other oil paper maintains a strictly paid-in-advance circulation. These facts prove this paper's news value.

Oil men want and need the accurate last-minute news and helpful counsel in ***National Petroleum News.***

If you are not sharing this outstanding oil paper value with 15,563 other oil men, join this big family of readers today.

Use This Coupon

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I want to join the big family of National Petroleum News readers. Enter my order for 52 weeks. Enclosed is $3.50 (Foreign $5.)

NAME .....

Address ..... **City** .....

Division of industry engaged in .....

Your truck is a signboard *with two sides!*

Says the Pure Oil Company—

"The appearance of our delivery trucks is one of the most powerful mediums available to us for moulding public opinion. Many of our customers never see our offices, our plants, nor meet our officials—it is through our motor trucks and salesmen that they form their opinion of our company."

The Pure Oil Company uses Budd Duals. Their trim, handsome tankers glide over the roads on these clean, glistening, streamlined discs of steel. Every day, moving from place to place, seen by countless people, these tankers flash their good impression.

It's good business to give your trucks the attractiveness that Budd Duals give them—

It's good business to give your tankers passenger-car speed and riding comfort—

It's good business when you can have *one* tanker doing the work of *two*—tires giving 15,000 to 20,000 miles of service—trucks still up and going when they would ordinarily be worn out. On tires alone Budd Duals are saving other truck owners $300 and more per year—and *per truck!*

And you can have all these features by saying "Budd Duals" when you buy your next tanker!

BUDD DUALS

Can't wobble—

Can't shimmy—

And they stop side-sway!

BUDD Wheel Company,
Detroit

© B. W. Co., 1928

Knobbed

For Traction, Cushioning Action and Slow, Even Wear

Giant Knobs form a skid-proof tread—provide your trucks with a safe, sure "footing" over any going. Each knob is a separate cushioned buttress against road shock.

Even displacement of rubber under load and the special wear resisting tread compound of which these Giant Knobs are made, cause Fisk Giant Non-Skid Cushions to wear down evenly and slowly—to last longer.

In the complete Fisk Commercial line you will find the tires best suited to all your trucks—tires that will reduce your haulage cost per mile.

THE FISK TIRE COMPANY, Inc.
Chicopee Falls, Mass.

FISK TIRES

Guaranteed Color

Crystal White!

Perfect...stable... crystal white color is a *guaranteed* quality of PARCO Gasoline.

But, with our flexible, rigidly controlled refining processes, PARCO also brings you the ideal volatility for each particular season *plus* the high anti-knock values of a highly cracked product.

PARCO combines *all* the advantages of straight run with those of cracked gasoline into a pre-determined, rigidly controlled, premium, all year motor fuel—WITHOUT PREMIUM PRICE.

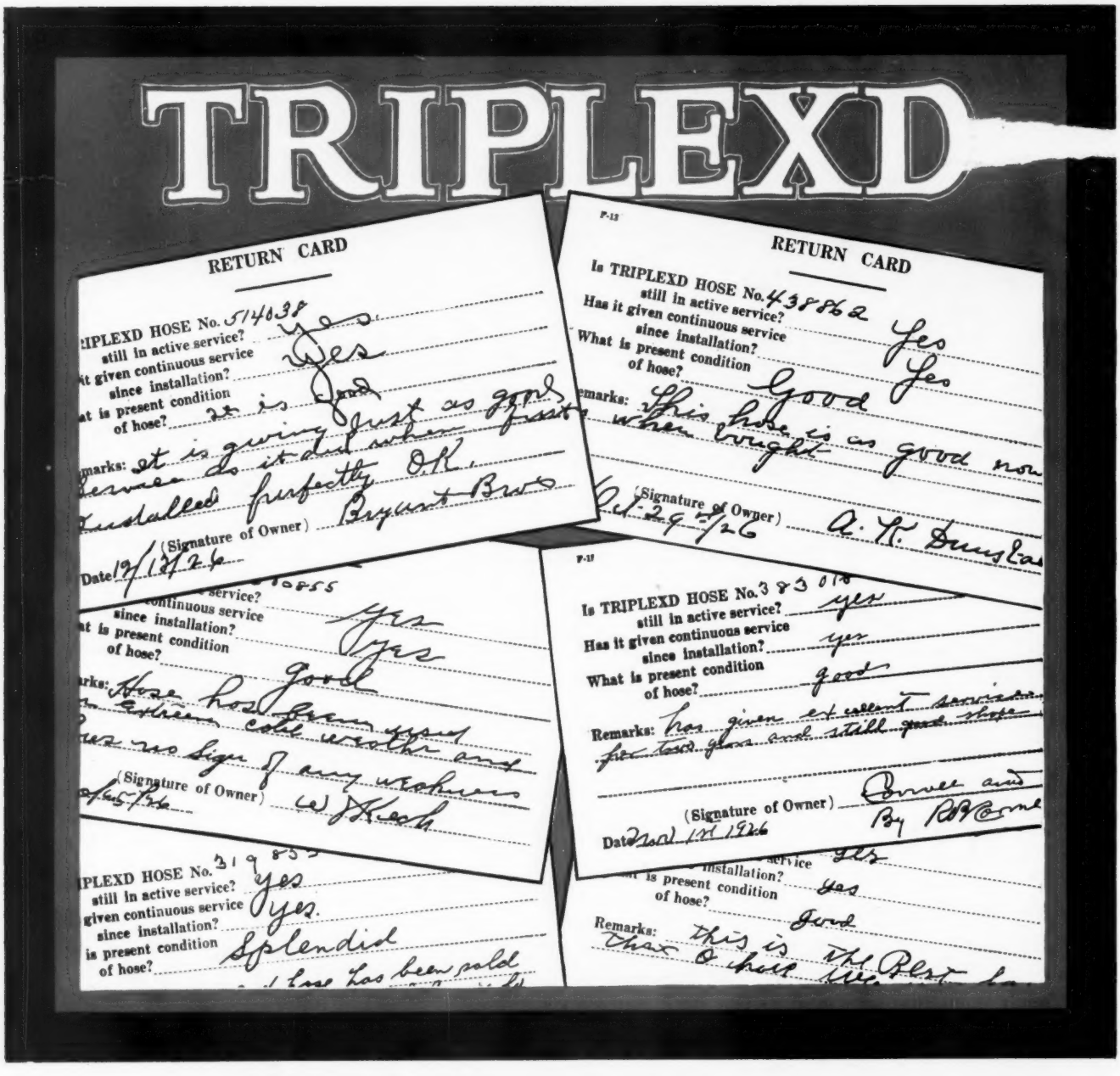
Order a car of PARCO · · · See for yourself.
Our nearest office will quote you.

PRODUCERS AND REFINERS CORPORATION
Independence Denver Chicago Tulsa Salt Lake City Memphis Omaha

PARCO PETROLEUM PRODUCTS

Our modern Refinery at Parco was built to advantageously supply Northwest jobbers.
Our Refining Facilities at West Tulsa and Blackwell mean advantageous freight rates for Southwest and Central States jobbers.

PARCO
GASOLINE
Seasonably Volatile ... Anti-knock



"Ask the man"—

The best way to check advertising claims is to get the opinion of the man that uses the product....We have been telling you there is no other hose like Triplexed.... Thousands of return cards like those above are our authority.

METAL HOSE & TUBING CO.
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236 Tillary Street
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